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**The Dissertation Committee for Mary Munro Brook certifies that this is the
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**Re-scaling the Commons:
Miskitu Indians, Forest Commodities,
and Transnational Development Networks**

Committee:

Gregory W. Knapp, Supervisor

Charles R. Hale

Karl H. Offen

Rodrigo Sierra

Kenneth R. Young

**Re-scaling the Commons:
Miskitu Indians, Forest Commodities,
and Transnational Development Networks**

by

Mary Munro Brook, B.A.; M.A.

Dissertation

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Dedication

To my mother - for also finishing a doctoral degree in 2005.

To my daughter - you lived your first year while I was writing this.

To my grandmother - for your 100th birthday.

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**Re-scaling the Commons:
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and Transnational Development Networks**

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Private and public forest management projects in developing countries network at a variety of scales, but these scales are influenced by actors as part of an ongoing “politics of scale.” Field study of ten different projects in eastern Nicaragua in 2002 and 2003, including long-term fieldwork in Miskitu indigenous villages, allowed me to document how forest management involved several scales: village, multi-village bloc, municipality, autonomous region, nation, and global. I employed a range of qualitative methods, including participant observation, field walks, and case study comparison. Over twenty months I carried out more than two hundred interviews with a broad range of actors. I expanded these findings with quantitative results from household surveys on governance and forest use. In addition, I utilized extensive secondary sources, including state, business, nongovernmental organization, and donor reports. Outcomes in the case studies often involved compromises between alternative and sometimes competing

perspectives and agendas put forth by actors at multiple governance scales. Some actions coincided with international agendas, while others challenged outside interventions. Even though indigenous populations were often not included in making important decisions, local, sub-national, and national scales were more powerful in relation to international scales than frequently depicted in globalization literature. Although forest commodity projects tend to go through a somewhat predictable series of stages, including conceptualization, negotiation, and implementation, the details of the politics of scale are often unpredictable. Development is dynamic, case-specific, and open to multiple interpretations. Nonetheless, two independent variables consistently surfaced during my analysis: security of land tenure and strength of local governance. Restricted indigenous self-determination and unclear, insecure land tenure are characteristic in eastern Nicaragua and often contribute to conflict in forest development projects.

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INTRODUCTION

Re-scaling Nicaragua's Forested Commons

The commons—a material and symbolic reality, always changing, never *purely* local or global, traditional or modern, and always reflecting the vibrant colours of its ecological, political, cultural, scientific and social character—is not at all disappearing into the dustbin of history. To the contrary, we find that the commons are increasingly becoming a site for robust and tangible struggles over class, gender, nation/ethnicity, knowledge, power and, of course, nature (Goldman 1998: 14; italics in original).

Utilizing a “politics of scale” framework of analysis (e.g., Smith 1992; Kelly 1997, 1999; Swyngedouw 1997a, 1997b; Towers 2000; Leitner et al. 2002; Leitner 2004), I identify how different development players network at a variety of “scales,” or dynamic levels of organization, from the local to the global to advance their goals for Nicaragua's forested commons. International donors and agencies, environmental organizations, state institutions, and private firms initiated forest development projects in indigenous villages located in the municipality of Prinzapolka. My research evaluates how Miskitu populations responded to these initiatives in 2002 and 2003. Using ten forest development case studies, I record interactions at several scales in eastern Nicaragua: village, multi-village bloc, municipality, autonomous region, and nation. I also define how the cases fit with international forest governance, neoliberal conservation, and the globalization of development policy.

Similar to many indigenous territories in Latin America, the forests discussed in this study are communally held, although tenure is largely informal. Common-pool areas claimed by Miskitu cover the majority of Prinzapolka, but coincide in various places with state and private claims. Simultaneously, these forests are viewed as global commons amidst growing international interest in environmental goods and services, such as

certified lumber, carbon storage, and biodiversity. This work examines the intersections between multiple claims to, and development schemes for, the same forest.

The fact that the development stories I discuss take place within common-pool property is highly important to their outcomes for two central reasons. First, there is tenure insecurity, leading to conflict, in many Nicaraguan communal areas. Second, due to the land ownership structure, there were proposals generated for shared village governance of development enterprises. Merging communal governance with public programs and private enterprises is increasingly promoted in indigenous areas across Latin America, whether or not there are formal land titles or institutions, making this a timely and significant study.

“Glocalization” (*sensu* Swyngedouw 1997a, 1997b) is a popular term, as demonstrated by its frequent usage (e.g., Cox 2002; Gibson-Graham 2002; Herod and Wright 2002; Leitner et al. 2002; Keeling 2004). Along with upward shifts in decision making power, glocalization includes the simultaneous process of localization, or down scaling, evident in state devolution and the rise of locally-based, non-state institutions. Nevertheless, while not disputing that processes of globalization and localization are occurring, I argue that the re-scaling process is more complex. Swyngedouw also acknowledges there is a re-scaling outward, or horizontally, to private capital as actors engage with others at the same scale. However, Swyngedouw’s economic focus may be too narrow. Neoliberal development creates both economic and political transitions. My research examines horizontal shifts in political organization as well. In addition, while Swyngedouw focuses primarily on global, national, and local scales, I aim to evaluate the

value of including other intermediate scales, such as blocs, municipalities, districts, and regions in glocalization and politics of scale analysis.

Using a political ecology framework (e.g., Rocheleau 1995; Peet and Watts 1996; Bryant and Bailey 1997; Peluso 1999; Zimmerer 2000a, 2000b; Zimmerer and Bassett 2003), this study examines transition from state-led forestry to forest governance. Governance is characterized by broad partnerships between state, private, nongovernmental, and civic institutions. Yet, I recognize the continued centrality of the state as an agent of domestic and international development. Global forest governance includes non-state and market institutions without eliminating the state as an influential actor. In Nicaragua, there has been considerable donor effort to restructure and strengthen state institutions in recent years. This is just one example of the complexity of neoliberal reform evident in my research.

There are three core research objectives. The first is to demonstrate scalar shifts and network partnerships in Nicaraguan forest management and show how these formations relate to recent conservation trends, such as the use of large spatial scales, market-based approaches, and socio-ecological hybrids. In examining changes in scales and networks, I am interested in aspects such as the partners involved in governance, institutional structure and density, spatial size, equity and power between actors, and interconnections between institutional and ecological scales. The second objective is to analyze development aid targeted at indigenous populations in Prinzapolka municipality in terms of its impact on self-governance and communal tenure. I am curious about governance structures, representation, participation, leader selection, and the influences of higher scales on local institutions. This aspect will be evaluated through an analysis of

decision making, with the goal of determining if decentralized and indigenous governance scale is important in decisions (e.g., location, goals, budgets, personnel, etc.) within development projects. The last objective is to compare cross-scale and multi-sector interactions in a series of case studies. Three of ten cases are examined in detail, a forest genetic reserve and seed bank, an indigenous forest extraction corporation, and the Atlantic Biological Corridor, while other forest development firms and networks provide supplemental information.

Although the devolution of control over forest management has been contentious in Nicaragua, it has advanced partially due to leveraging from local actors. While the conservation and development models that are presented in the next section and throughout this work were promoted by international agencies, Nicaraguans were fundamental to their application. Many resource development studies either emphasize the role of powerful international players, such as the World Bank and the World Wildlife Fund (Rich 1994; Le Prestre 1995; Wapner 1996; Wade 1997; Larson et al. 1998), or they focus on local decision making by communities and individuals (Mosse 1997; Goodwin 1998; Gibson 2001). My research bridges this divide. It treats not only both global and local actors (as in Swyngedouw 1997a, 1997b; Smith 1998; Ostrom et al. 1999; Prugh et al 2000; Herod 2003; Fogel 2004), but also all those located at scales in-between. *Analysis of multiple scales helps one to think critically about assumptions formed at any particular level.*

Below I describe the study area, including institutional and ecological characteristics, and discuss my methodology. Chapter One provides the epistemological foundations of the study with a literature review of relevant aspects of “politics of scale,”

political ecology, common-pool resource management, forest ecology, and indigenous development. Chapter Two presents key transnational actors, in particular the World Bank, United States Agency of International Development, and the World Wildlife Fund, and some of their preferred forest development models, such as extractive reserves, biodiversity conservation, and community firms. Chapters Three and Four discuss historical and contemporary shifts in Nicaraguan forest and land tenure policy, resource extraction, and indigenous development. Chapter Five looks at decentralization to sub-national governance scales in the North Atlantic Autonomous Region (RAAN), which was founded in 1987. Decentralized governance scales in the RAAN include the regional and municipal governments, multi-village blocs, and communal village institutions. Chapters Six and Seven explore the scaling and networking of forest management case studies in eastern Nicaragua; and the concluding chapter compares these cases, summarizes the trends they present, and suggests areas for further investigation.

THE STUDY AREA

At a conference in 1998, a renowned Central Americanist asked me if I would be able to generalize my results given the uniqueness of Nicaragua's Autonomous Region. While the specificities of the Miskitu and their communal forests and institutions are described in this work, in spite of the region's particular history and culture, donors and development advocates use similar blueprints as they do in other developing countries. The environmental discourses and transnational institutions guiding policy reform in eastern Nicaragua are similar to many other places. Basing this work in the larger development literature, I was struck by the relevance of these case studies to recent global development debates. Readers with international experience are likely to find

interesting parallels between eastern Nicaragua and cases they are familiar with in other areas. However, as with any study based in one particular country, blind generalization to other places can be dangerous.

Given the fact that Nicaragua is unique due to regional political autonomy, one would expect international development programs to be structurally different than other initiatives in other parts of the world. I suggest the Autonomous Region government was treated like just another “cog in the wheel” of a hierarchical state structure (for example, see the Atlantic Biological Corridor case study in Chapter Six), which demonstrates the standardization of global environmental management. What is unique about the Miskitu, in terms of self-governance or resource utilization, was not adequately recognized or valued in the development planning structure documented. It is important to contrast my detailed description of multi-scale processes with the oversimplified development discourses that often guide policy intervention in tropical forests (e.g., Campbell and Martin 2000; Seymour and Dubash 2000) and indigenous villages (e.g., Preston 1996; Plant and Hvalkok 2001; Carino 2004) .

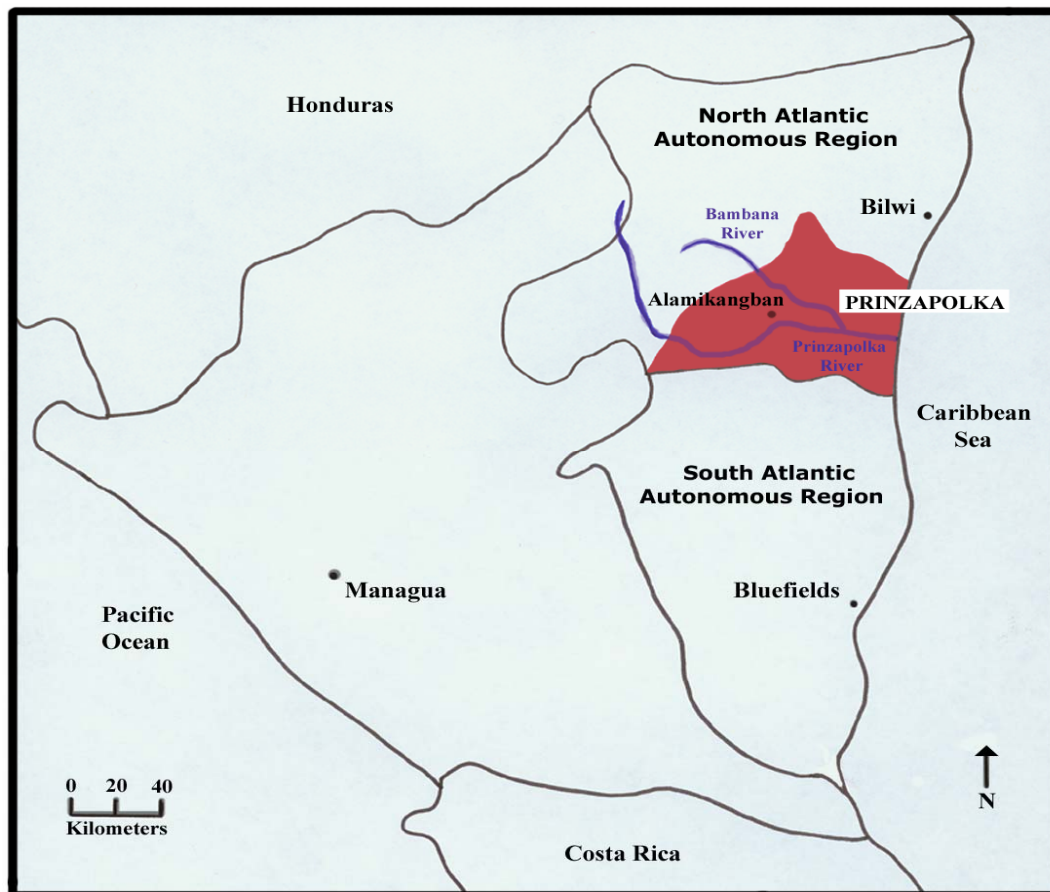
Historically, Nicaraguan governance was highly centralized. This study focuses on decentralization during the past quarter century. In the eighties, Nicaragua was a prime example of a Socialist state-led economy. Following the 1979 revolution, the Sandinista government had a hands-on approach to natural resource development, which included state-run forest extraction and processing companies. Concurrently, the Sandinistas initiated decentralization reforms, including political autonomy in eastern Atlantic Coast, which makes up nearly fifty percent of the land mass of the country.¹ The

¹ The terms Atlantic and Caribbean will both be used to refer to Nicaragua’s east.

Atlantic Autonomous Region is split into northern and southern zones. This work focuses on the northern region, of which Bilwi is the seat.² Bluefields is the seat of the south Atlantic. The autonomous regions and their capitals are demonstrated in Map 1.

MAP 1

Study Area Location



The Nicaraguan state's forest development goals emphasize the Caribbean region, where approximately eighty percent of the nation's remaining forests are located. While the RAAN covers approximately twenty-six percent of the national territory, more than

² The name of Puerto Cabezas is still frequently employed in Nicaragua to identify the capital of the RAAN. The state recognized the indigenous term Bilwi recently and it is increasingly employed. The name Puerto Cabezas refers to the municipality of which Bilwi is seat.

forty percent of the nation's forest cover is located there (CRAAN/WWF/INAFOR 2003). The Caribbean region has the lowest population density, highest rates of poverty, and highest indigenous percentages in Nicaragua. There are more than 80,000 Miskitu in the RAAN today, although precise estimations vary. After the Maya, the Miskitu are the largest and most widely dispersed native peoples in Central America, covering more than five hundred kilometers of coast in Nicaragua and Honduras.

RAAN institutions can be split into the regional government and less formal indigenous structures. During fieldwork, and since its creation in 1990, the regional government structure was essentially an extension of the central government with a limited mandate to assure multi-ethnic equity and participation. The RAAN government structure is uncommon because of its attention to governance equity between ethnic and racial groups. However, it is incorrect to assume that the regional government constitutes "indigenous governance," although a substantial percentage of officials are indigenous and, during the fieldwork period, the governor was Miskitu.

Nicaragua's indigenous people have rights to the communal land and resources they customarily used. This was internationally recognized in 2001 under the Inter-American Human Rights Court decision in favor of the Sumu-Mayangna indigenous community, Awas Tingni, in a case against the Nicaraguan government. Sumu-Mayangnas live in the interior of the RAAN and their population reaches approximately ten thousand.³ In the national commission to negotiate boundaries for the village of Awas

³ Historically known as Sumu, the term Mayangna is considered to be more appropriate since the title Sumu was derogatory label given by the Miskitu. However, some within the ethnic group still prefer the traditional name. In order to recognize the wishes of both camps, the hyphenated term Sumu-Mayangna will be used in this work.

Tingni after the decision of the international court, there were thirteen state lawyers and only two lawyers to represent the indigenous position, along with three community members (Cunningham 2002). The negotiation structure attests to the limited degree of indigenous voice in demarcation matters in Nicaragua. With on-going delays in land demarcation and titling, Nicaragua has violated international and national indigenous rights norms and the 2001 decision of the Inter-American Human Rights Court.

In Awas Tingni, as in many parts of the RAAN, there are multiple conflicts over land rights due to contradictions between historical claims, which were seldom formalized with state titles and current use. This often leads to deadlock between indigenous villages and ethnic groups over demarcation. According to a lawyer in the Awas Tingni case, the process was complicated by competing logging interests.⁴

Miskitu populations in the study area in eastern Nicaraguan have vast land claims, but tenure regimes overlap. Historically, land was sold and given to political, military, and economic allies of national elite. Foreign corporations purchased large areas. Since the end of the Civil War in the 1980s, ex-combatant groups have been granted land. As in many developing countries, protected areas were created without local consultation or even knowledge of the process.

Prinzapolka municipality, the focus of this study, has a large Miskitu population. There are a total of thirty-four villages in the municipality. These are predominately located along the Prinzapolka and Bambana Rivers, shown in Map 1 above. Twenty-five villages are indigenous and all are considered Miskitu, although some were historically

⁴ Pers. comm., Spanish, 03/11/03.

Sumu-Mayangna.⁵ The remaining nine villages are *mestizo*⁶ and are located along the upper Prinzapolka River. As shown in Map 1, the municipality is located in the south of the RAAN and the village of Alamikangban is the seat.

Alamikangban was the main fieldwork site for this study.⁷ Like most indigenous villages in the region, a large portion of the approximately one thousand residents is under the age of eighteen. The town consists of a small business district and around 150 houses (author's fieldnotes). There is a school, health clinic, courthouse, municipal building, and a few diners and shops. The staff of these institutions is largely made up of outsiders who relocated to Prinzapolka, while many store and diner owners are new mestizo immigrants. Most native families support themselves with a mix of agriculture, hunting, gathering, fishing, forestry, and poultry rearing. *All these activities are carried out on communal land.* Alamikangban residents pool labor during planting and harvesting.⁸ While villagers predominately practice subsistence agriculture, during fieldwork, there was limited commercial production of rice, beans, corn, tomatoes, and watermelon. A few elite families raised cattle.⁹

⁵ See Gudián (2000) for a discussion of this transition.

⁶ *Mestizo* means of mixed origin: most often it denotes indigenous people of the central and western regions mixed with "Spaniards," as the non-indigenous people of the west are called in the Caribbean region.

⁷ The official spelling of the town is Alamikamba, but Alamikangban reflects its Miskitu origin. The original name was shortened to ten letters for telegraphing by transnational corporations (Malefant 1993).

⁸ Pooling labor is common in Miskitu villages. In some areas, a chime is rung and villagers gather to work on a task. In Alamikangban, the process works at the scale of the household: whatever quantity of workdays lent from your household will be returned in roughly equal numbers from the recipient house.

⁹ Some villagers complained during my fieldwork that ranchers utilized vast communal areas that other villagers did not, but no action was taken over land use inequity among villagers while I was in Alamikangban. Cattle production was still less common than prior to the Civil War in the 1980s. It was now concentrated within elite families and non-indigenous migrants. More people had cattle prior to the war, but herds were small.

A list of commonly utilized tree species in Appendix One, which I compiled in 2002 using ethnographic methods, suggests broad use of tree resources. Villagers occasionally stated that some practices had been more common in the past, such as making rope or sacks, but these products are now widely purchased. However, many important tools, such as fish traps and spears, digging sticks, rice mortars, and canoes and paddles, are handmade quite similarly to historical periods.

Communal agricultural lands in Prinzapolka are divided based on family usufruct rights. Semi-permanent plots are determined in flood plains, while areas within the forest are used on a rotating basis. Although Alamikangban claims more than 98,000 hectares (Hale et al. 1998) for a population of approximately one thousand, the most valued agricultural land along the floodplains of the river is limited. Families stake out plots along the riverbank in both directions from the town, paddling a distance in dugout canoes to their fields.

Within communal areas, families prioritize claims to the best floodplains (author's fieldnotes). There is some hierarchy in the determination of these rights, as families with historical claims or greater prestige in the village use advantageous areas, such as those located closer to the village, which reduces transportation time. These claims are semi-fixed in that there is considerable consistency from year to year, but there are changes due to migration, marriage, or a range of other situations and events. If an area is not planted seasonally, another family may negotiate rights to use the plot.

In Miskitu territories, common-pool tenure is a fluid, informal process carried out through daily practices and negotiations (author's fieldnotes). Informality allows for flexibility and change over time. Nevertheless, the lack of formal demarcation can

become a threat to ownership during negotiations with the state and firms. With resource marketing, as with the development case studies in my research, the resolution of land tenure often becomes necessary. After decades and centuries of conflicting claims, the process is anything but simple. Land tenure in Prinzapolka involves multiple and ever-changing interpretations of occupancy rights and state law. In Nicaragua, a fundamental contradiction exists because the state claims all untitled lands, while indigenous leaders frequently charge that the entirety of the Caribbean region is indigenous land in spite of the lack of demarcation. There are contrasting perspectives on how land tenure conflicts should be resolved. Both the state and the Miskitu claim the authority to define boundaries. The new land titling law in early 2003 delineated responsibility among sub-national and communal authorities, but there is little precedent for decentralized cooperation. Moreover, sub-national resources for conflict resolution, surveying, and titling remain unavailable as of July, 2005.

Several Prinzapolka villages were granted state titles for small parcels of land by the Harrison-Altamirano Titling Commission between 1917 and 1920. Alamikangban received 250 hectares (Gurdián 2000). Yet, in contemporary periods there are significant limitations to Harrison-Altamirano land grants. First, the size of these lands was based on the resident population of the village at the time, which was invariably small. These lands are insufficient for the larger populations that exist in many areas today. Second, several village land titles were inscribed under individual families. This has created conflict between families within villages, such as Alamikangban and Tungla, because off-spring of town founders perceive that their rights surpass those of other villagers so that they should receive greater rewards from resources sales (Gurdián 2000; author's fieldnotes).

A factor that adds to tenure complexity in Prinzapolka is the existence of numerous types of property rights within a communal area. Some villages are seen to have legitimate or unquestionable rights, while others have greater insecurity. The regional government has recognized the claims of some villages, such as Layasiksa. There have been participatory mapping projects, such as the 1997 study by the Central American and Caribbean Research Council (CACRC), which help to document historical occupancy and use in much of the Autonomous Region (Hale et al. 1998). In these same areas, various types of private and state titles exist from prior to 1987. For example, large areas of Prinzapolka were sold in 1974 to four North Americans, as discussed in Chapter Five. Another large area was granted to a military colonial during the Somoza area.

Recent privatization has occurred in the form of Agrarian Reform and “right of domain” titles, which are granted after consistent occupation and physical improvements to the land claimed, for example, with homesteads, agriculture, or ranching. Most recently, the 2003 land demarcation bill mandated that all settlers that moved onto indigenous communal lands after 1987 will be required to seek permission from indigenous groups, or leave. This clause has yet to be enforced, because in most areas, formal indigenous communal land claims remain undetermined.

There are additional titles and property claims within these same communal areas. For example, the municipal government has the right to declare local parks or use lands for infrastructure. Municipal governments sometimes overstep their legal rights by making land grants to individuals. The central government also claims the right to make land grants. After the Civil War, with a letter from President Chamorro, a group of indigenous ex-combatants was given communal title to a forested area within Prinzapolka

(author's fieldnotes). In recent years, they have worked to formalize this claim, which is located within communal areas of two villages. Some nearby villagers respect the ex-combatants' claims, but others do not. The ex-combatants found a foreign logging company sponsor to pay for titling, although they promised to return the payment through future lumber extraction. The state eventually recognized their land rights and a formal logging concession was granted.

Land is important to the Miskitu and they have strong opinions about their right to it. Awareness of communal land rights increased during the civil war in the 1980s. Describing events from the war, an elder from Alamikangban stated in 2002, "We fought for this land. We were jailed. And now people come and want to take the mahogany, pine, and other resources. We shed our blood for this land. That is why we will not let people come in so easily."¹⁰ Gudián (2000) documents similar narratives from Alamikangban. In recent years, property disputes with foreigners and non-indigenous Nicaraguan populations have challenged communal claims, but not all local populations agree with the elder. Since some groups have forged partnerships with outsiders and expect rewards in the form of jobs or markets from these populations, there has been division within Prinzapolka villages.

Many important Miskitu cultural "traditions" were appropriated from outside groups (Offen 2004). Once practiced in villages, they were modified over time. I demonstrate these processes using the example of self-governance of land and forest resources in a section of the Prinzapolka municipality located along the upper and middle

¹⁰ Pers. comm., Spanish and Miskitu, 04/22/02.

course of the Prinzapolka River. Miskitu practices are locally unique and there are differences within the municipality.

At the end of the civil war in the 1990s, Alamikangban started to elect *sindikos* (common-pool resource overseers),¹¹ but the process has been inconsistent. The informal position of communal leaders in Alamikangban prior to 1990 contrasts with some other areas of the RAAN where communal leadership was more developed. In recent years, considerable fluidity in Prinzapolka land tenure has derived from the power allotted to the village *sindiko* in administering communal lands. There are vast differences between individual leaders. Some sell plots within communal land claims, while others aggressively organize to expel squatters. To add to the complexity, individual leaders may change over time (author's fieldnotes). Many are strong advocates for communal claims when they are elected, but they sometimes become corrupted and begin to sell land or resources for personal gain.

In some areas, there are strict norms for the annual selection of *sindiko*, *wihta* (judge), and elders. In many villages, there are additional leaders, such as communal police and combatants. Historically, Alamikangban and surrounding villages had representatives referred to as the *alkalde*.¹² Elders, pastors, and teachers were important leaders as well. A central method of decision making historically and to the present is the community assembly, which are common in Miskitu villages. I have attended approximately two dozen assemblies since 1996. They are generally held in the church or school, but in Alamikangban, the meeting point is the riverfront, unless it is raining. The

¹¹ The term is *sindico* in Spanish. I spell the word 'sindiko' as I have seen it in Miskitu villages.

¹² The word is taken from the Spanish "*alcalde*," meaning mayor.

first photograph in Appendix Five demonstrates an Alamikangban public assembly in 2002 on the topic of communal land. Villagers are seated on big-leaf mahogany timber.

The origins of commercial timber extraction in the region predate the modern Nicaraguan state. Indigenous populations traded among themselves and then, later with the British. Since statehood, forestry development has gone through four stages. The first stage was dominated by international corporations, largely from the United States, with connections to the Nicaraguan state (Sollis 1989). Starting in 1979, the second stage describes Sandinista state-led enterprises. Export levels lowered because of a U.S. economic blockade, violent conflict in production zones, and lack of forestry and management experience on the part of state business managers (Alves-Milho 1996). The third stage involved a combination of Nicaraguan and multinational corporate partnerships organized around the legal and illegal extraction of select timber species, predominately mahogany. The peak of corporate extraction in Prinzapolka from 1992-2002 is covered in detail in this study because it provided the experiential base that local populations built upon to negotiate with incoming development projects. The fourth stage includes the onset of the transnational “conservation with use” forest management initiatives discussed as case studies in my research.

From the early 1900s until 1960, Alamikangban served as a port for lumber, bananas, gold, copper, zinc, silver, and lead (OPHDESCA 1992). In the 1940s, an airstrip was built on the edge of Alamikangban to fly rubber out on planes destined for the U.S. military industry. Foreign companies logged the area until the late 1970s.

In 1960, Alamikangban was literally left high and dry when the river port shifted downriver to the village of Limbaikan. With heavy sedimentation, large vessels could no

longer reach Alamikangban. Some employment resumed in the 1970s when North American ranchers purchased a large area to raise cattle and grow feed. These ranchers abandoned Nicaragua with other foreign logging and mining operations at the transition to socialism in the late 1970s. While Alamikangban elders recalled a bridge across the river at the dock, delivery of the daily paper, large restaurants and canteens, and streetlights, none persisted to recent decades.

When logging company representatives arrived to Alamikangban after the Civil War in the 1980s, they found that indigenous populations could still be exploited as a cheap workforce, yet new village representatives now demanded to be compensated as authentic property owners. The state reinforced this position, as a result of the 1987 Autonomy Statute, by requiring village representative signatures for forest concessions.

In the 1990s, private enterprises harvested thousands of big-leaf mahogany trees from Prinzapolka. A local nongovernmental organization (NGO) noted in late 1992 that there were 2,279 mahogany trunks in Alamikangban waiting for transportation (OPHDESCA 1992). Companies entered Miskitu villages with the goal to profitably extract and market precious wood. In this post-war context, they encountered a situation both similar and different from when major international logging companies had worked the same zone in prior decades. While these Miskitu villages had considerable experience with logging, self-governance under formal leaders was incipient. The central government historically decided forest concession locations and production levels and the local population did not object. Older populations often recall that under President Somoza, they were largely content as workers. They consistently remember employment

levels to have been higher than they were during my research, and wages previously covered more purchases (author's fieldnotes).

With recent commercial mahogany extraction in the 1990s, there was a significant increase in internal village conflict as the political and economic ramifications of new local authority roles were disputed. In some villages, leaders were self-named, or chosen by the local elite, rather than elected by the population. At the time of fieldwork in Alamikangban, communal leaderships' positions were so contested that choices were no longer made in community assembly because they broke down into arguments and risked violence. A trend in many RAAN villages was for local leaders, even those elected by their peers, to manipulate new formal governance positions for personal gain at the expense of communal benefit. Consequences in Alamikangban included the rapid extraction of precious lumber, which was almost entirely mahogany, partnered with an inequitable garnering of political and economic resources.

Large companies withdrew from Prinzapolka in the late 1990s, primarily due to the extraction of the most accessible mahogany trees. For a few years, Alamikangban became infamous for illegal mahogany, which local loggers still knew how to find and intermediaries purchased. In 2002, the state identified Prinzapolka as the poorest municipality in the country. Extreme poverty and rapid environmental degradation stimulated international attention and subsequently, the creation by donors, environmental organizations, state institutions, and private firms of the cases reviewed in my research. Project advocates argued that appropriate use of remaining forest resources could spur economic benefits, while assuring the conservation of areas and species currently threatened. I think these development schemes are "eco-commodity dreams"

because they impart an often unrealistic utopia where environmental factors share equal importance with business agendas. Although seldom actualized, donors promote plans under which they suggest that culturally sensitive, environmentally-friendly, and efficient resource use and marketing will reverse poverty and ethnic repression.

Commodity Dreams

The potential development of Nicaraguan markets for environmental goods and services, along with more conventional forest commodities such as lumber, has captured the attention of actors at various scales. If these commodity markets take off, donor countries will receive returns on their investment and increase the likelihood of future lending possibilities. Commodity expansion can bolster trade, which will bring positive repercussions to donor nations by assisting national firms, while assuring an ongoing supply of goods and services to global markets. Regardless of claims to want to assist poor nations and marginalized populations, there are pragmatic reasons that many donors foment “commodity dreams” in developing countries.

Nicaraguan state officials often buy into donor-driven commodity dreams. Their production experience is based largely on meeting international demands for particular goods, such as sugar, coffee, cattle, seafood, or lumber. They strive to balance the state budget and promote a healthy economy, whether the commodity being marketed is genetic biodiversity or industrial plywood. Whether or not leaders have bought into international “sustainable development” rhetoric, in recent years there has been considerable national enthusiasm over carbon markets and other environmental services, spurring “green” dreams for state leaders.

Miskitu populations harbor their own dreams. Villagers often hope for a corporate benefactor, which is what many perceived historical foreign logging and mining companies to have been (author's fieldnotes). After the Civil War in the 1980s, many Miskitu also dream of self-determination and local control over natural resources. The communal micro enterprise projects international donors are handing to them appear to be an ideal solution by allowing for a source of jobs and revenue, while at the same time supporting self-governance. Can both Miskitu dreams simultaneously be realized?

The international development dream is much like the "American dream" in that it is built on the premise that people can move rapidly from marginalization and poverty to empowerment, opportunity, and wealth. Development proposals generally suggest that it is possible for there to be benefit for all stakeholders involved. Yet, many times, plans do not become a reality. As shown in this work, if development projects advance, dreamers and idealists are usually forced awake to face tradeoffs and compromises.

Forest Characteristics and Ecology

The low elevation municipality of Prinzapolka is approximately 6,250 square kilometers. Located at 13° 24' north latitude and 83° 33' west longitude, it is hot, humid, and wet most of the year. A large quantity of fresh water flows through eastern Nicaragua. Approximately ninety percent of all runoff in Nicaragua ultimately flows into the Caribbean (Weaver and Bauer 2000). The Prinzapolka River is one of thirteen large rivers. According to the Nicaraguan Institute of Territorial Studies (INETER), the average yearly precipitation in this area ranged between 2,750 and 3,250 millimeters between 1988 and 1998. The people and forests of the municipality are frequently impacted by periodic floods and natural disasters. While hurricanes are rare, their impact

can be devastating (Mallona et al. n.d.; Boucher and Mallona 1997; Vandermeer et al. 2000).

There is sparse reliable data covering Nicaraguan forest ecology in historical and contemporary periods. At the time of fieldwork, Nicaragua had not completed a detailed national forest inventory, although general land use types were defined and mapped in 2000 (INAFOR 2001a). A few select areas of the Caribbean have received international research attention in recent years; for example, the forests hit by Hurricane Joan in the 1980s (e.g., Boucher and Mallona 1997; Vandermeer et al. 2000).

At the end of the last century, there were approximately 7.7 million hectares of forests remaining in Nicaragua (GRAAN 1999). The vast majority was lowland tropical deciduous forests with smaller areas of pine forests. Of the more than thirty thousand square kilometers of the RAAN, over twenty thousand are seen as having forestry potential based on climatic conditions and soil properties. A recent National Forest Institute (INAFOR) (2001a) census in the RAAN documented approximately nineteen thousand hectares of existing broadleaf forest and slightly more than four thousand hectares of pine forest.¹³ INAFOR documented Prinzapolka to have more than 1,600 hectares of open broadleaf forest and nearly 2,200 hectares of closed broadleaf forest, close to 500 hectares of open pine forests, and more than 250 of closed pine forest.

Recent forest sector analysis was made difficult by the high rate of undocumented illegal logging. In recent decades, nearly all scientific forest surveys in Prinzapolka occurred in the context of private management plans.¹⁴ However, intermediaries who did

¹³ This census included the municipality of Waslala, as the RAAN legally should, but seldom does.

¹⁴ See Bustamante and Ruiz 2000; Consultoria Forestal del Norte (COFORNO) 2000; Serfores 2000; Vidaurre 2000; and Zamora 1999, 2001.

not use management plans routinely paid local loggers to hunt for mahogany and mark trails to them. The practice of employing Miskitu mahogany hunters may have begun as early as the late nineteenth century (Weaver and Bauer 2000).

The following section provides an overview of recent characteristics of the two major ecosystems of concern – the moist broadleaf forests and pine savanna. These are the two largest and most economically valuable forest types. Miskitu populations have favorite trees for local use. See Appendix One for my list of the thirty-five most commonly utilized plant species in Alamikangban and their uses.

Lowland Tropical Broadleaf Forests

Tropical forests in Nicaragua are tall with mature crowns reaching thirty-five meters in height and structurally complex with various strata (Taylor 1963). Vegetation is made up of numerous lianas, epiphytes, palms, and broadleaf species (Godoy et al. 1995). Based on preliminary studies, these forests appear to be diverse, but more research is needed. The RAAN supports the majority of the 2,500 tree species that have been identified in the tropical moist forests of Nicaragua (Vandermeer and Perfecto 2002).

In Central American broadleaf forests, few species are typically exploited commercially. Dozens of options are overlooked due to the lack of a market (Tropical Science Center 2000). Two hundred trees have been identified to have commercial value; however, only thirty-five to forty are traditionally used in Nicaraguan industry (Vandermeer and Perfecto 2002), and even fewer dominate the lumber market. Across Central America, big-leaf mahogany (*Swietenia macrophylla*) and Spanish cedar (*Cedrela odorata*) often make up seventy percent of the trees utilized (Tropical Science Center 2000).

Distribution of mahogany in Nicaraguan forests is inconsistent: in forests where it is found, volumes range between less than one and five cubic meters per hectare. Nonetheless, the volume of big-leaf mahogany and Spanish cedar in relation to other trees in the forest is generally less than five percent of the total. Nicaragua's broadleaf forests have undergone centuries of selective exploitation of the most valuable trees (Weaver and Bauer 2000).

The mahogany range originally covered seventy-seven percent of Nicaragua. Large areas of Pacific mahogany (*Swietenia humilis*) existed along with big-leaf mahogany (Tropical Science Center 2000). The original mahogany range area in Nicaragua was over 9,400,000 hectares. By the late 1990s, an estimated forty-six percent of this initial range had been lost.

Another species gaining commercial attention is the tropical cedar (*Carapa guianensis*) known as andiroba. Two logging concessions in Prinzapolka, specifically targeting this species, were recently granted and both received international Forest Stewardship Council certification. Although numerous other species could be harvested, according to representatives of these logging firms, it was difficult to find markets, even for certified wood.

Based on sample plots in one Prinzapolka logging concessions, managed by the Úbeda Brothers, there was an average of two hundred twenty-five individual trees per hectare, comprising eighty-four species from twenty-one families (Oporta and López 2000). In total, there were ten species with commercial use, sixteen species with potential commercial use, and fifty-eight species without any commercial use. Slightly more than

one tenth of the species were not identifiable to company foresters, which suggests the need for more research and improved dissemination of information.

Caribbean Pine Savanna

There are four pine species in Nicaragua.¹⁵ Caribbean pine covers the largest area of the four. The natural distribution area of Caribbean pine is quite large; it extends south from Quantana Roo, Mexico and stops approximately twenty-five kilometers north of Bluefields, Nicaragua. Caribbean pine forests of the variety *hondurensis* are found in five countries: Mexico, Belize, Guatemala, Honduras, and Nicaragua (Denevan 1961).¹⁶

There is no definitive explanation for the distribution of pine savannas and rainforest in the Caribbean of Nicaragua. Some assume the savannas may have been caused by humans and fire (Alexander 1973). Others suggest that fire regimes may have worked in combination with hurricanes and other natural disturbances (Parson 1955). Still others point to soil and drainage patterns (Alexander 1973). However, Taylor (1963: 49) insists, “Any conclusion on the time and method of formation of these savannas must be largely conjectural.”

The pine savanna covers an extensive area of Nicaragua’s Caribbean region: approaching 500,000 hectares in the north and 37,000 hectares in the south (Vandermeer and Perfecto 2002). The mean annual rainfall is high for a savanna environment (Parson 1955). The poorly drained soils frequently flood, sometimes for extended periods.

¹⁵ The four types are *Pinus caribaea* Morelet var. *hondurensis* (Sénécl.) Barr. & Golf, *Pinus maximinoi* H.E. Moore, *Pinus oocarpa* Schiede ex Schlecht. subsp. *oocarpa*, and *Pinus patula* Schiede & Deppe. subsp. *tecunumanii* (Eguiluz & Perry) Styles (Styles 1994).

¹⁶ In 1868, Sénécauze described *Pinus hondurensis* as a new species, but it later became commonly known as *Pinus Caribaea* when Morelet defined eighteen species of *Pinus tropicalis* (Perera and Musálem 2003). *Pinus Caribaea* was divided in 1962 by Barrett and Golfari into three varieties: *caribaea* is found in the Caribbean, *hondurensis* in Central American, and *bahamensis* in the Bahama Islands.

Nonetheless, the sparse vegetation allows for insolation and more rapid drying when the sun shines (Alexander 1973).

In spite of low human population densities in the savanna ecosystem, during the short dry season, fires are so extensive that almost the entire savanna ecosystem is burned annually (Taylor 1963). Stands that escape burning for more than three consecutive years are extremely rare. Frequent fires may reduce growth rates as trees were recorded to only add an inch every few years.

Nicaragua's Caribbean pine forests are perceived to be degraded from extensive exploitation, burning, and cattle ranching (Perera and Musálem 2003). Some of the best remaining pine forests are believed to be found in the zone of Alamikangban (Vandermeer and Perfecto 2002). Savanna areas range from very open, with sparse pine making up the only non-herbaceous species, to more dense pine forest. Since pine is frequently the only large tree species and historically was clear cut, the Nicaraguan government traditionally viewed these forests as appropriate for even-age monoculture (ADFOREST 1992).

Since Caribbean pine can adapt to a wide range of environments, and is known to grow quickly, it has become popular for plantations in the tropics and subtropics of Asia, Africa, and the Americas. Caribbean pine trees grow up to forty-five meters tall and one hundred centimeters in diameter. They produce good lumber, although the wood is abundant in resin and very dense. Wood is easy to work with hand and electric tools, unless the resin coagulates. Caribbean pine wood is used in a variety of products from heavy construction to furniture, paper, and pulp.

CASE STUDIES

Specific development stories can illuminate trends that extend beyond a particular region. Case studies can provoke critical reflection on human-environment interactions (Moore 1996) and may suggest new ways of thinking about prior theoretical conclusions. Multi-scale analysis of case studies may be particularly helpful to understand forest policy change in developing countries because it highlights similarities and differences between local, sub-national, national, or international actions and allows for discussion of cross-scale interactions. My integration of scalar and network analysis throughout this work is an approach that has been experimented with recently. A few geographers have previously utilized both methods, such as Dicken et al. (2001), Leitner et al. (2002), and Perreault (2003). To my knowledge, my work is the only one that employs both frameworks for the detailed comparison of multiple case studies.

The balance between indigenous self-governance, social programs, ecological conservation, and forest product marketing was different in each international development project that entered Prinzapolka. Nevertheless, I argue that there are significant similarities. First, each promoted a commerce-oriented approach to the management of communal lands. Second, each assumed that external actors could propose and implement solutions to indigenous poverty. Third, each overemphasized global agendas and underemphasized local goals in project planning. However, there was a range of positions within these general trends.

The case studies addressed are just initiating. Many of the forest development models under review are less than a decade old. Processes and institutions are changing

rapidly at every scale of analysis. This study is an evaluation of early stages of processes that are likely to continue into the future.

The first case study is the Alamikangban Community Forest Genetic Reserve and Seed Bank, which is a village-based corporation for Caribbean pine seed harvest, processing, and sale. Seed collection first initiated at the end of Civil War in the late 1980s with funding from Danish Assistance for International Development. Seed collection continued in Alamikangban until 1994, but the project was abandoned in 1997 after successive crop failure due to fires or humidity. Production may reinitiate based on a proposal by the RAAN regional government, who gained sponsorship from the Nicaraguan Forestry Promotion Project, which the World Bank funded. Seed collection was delayed from its initial 2003 start date due to constraints at multiple scales.

The second case is the Limi-Nawâh Corporation, which is an indigenous-to-indigenous joint business venture between Cree and Dene populations in Canada and Miskitu and Sumu-Mayangna villages, along the Prinzapolka and Bambana Rivers. This case study first traces the Meadow Lake Tribal Council movement into Canadian forestry and social service provision in the 1980s. MLTC then established contacts in Nicaragua in the mid-1990s, leading to the creation of Limi-Nawâh in 2003. Limi-Nawâh began logging and milling lumber from communal areas during fieldwork. Although there are currently various sources of funding for the project, the original investment came from the Canadian government.

The third case study is the Atlantic Biological Corridor (ABC), a section of the larger Mesoamerican Biological Corridor. In 1998, ABC was started with assistance from Global Environmental Facility, the Nordic Development Fund, and Nicaraguan national

and regional governments. The Carl Bro Group provided technical support in conjunction with the Central American Regional Environmental Program (Proarca), which USAID funded and World Wildlife Fund and other NGOs implemented. The ABC administration decentralized to regional structures in 2003; consultants entered into nine Prinzapolka villages later that year to begin participatory development planning.

Initial organizational penetration during transnational development can be divided into conceptualization, negotiation, implementation, and post-implementation stages. The first three stages are evident in my three core case studies. While Glesne (1984) uses a stage approach to point out interactions between important development actors, her analysis is focused on understanding development project “failure.” The case studies in my research ranged in terms of “success” in 2003, but I am less interested in determining their relative success or failure and instead focus on stages of organizational and scalar processes.

The conceptualization stage of my case study projects includes broad global trends leading up to the prioritization of funding for specific development objectives. In the 1970s, the problem of tropical deforestation entered international policy circles. It was deemed to merit attention and was taken up by instrumental actors in development circles. By the 1980s there was increasing concern over the failure of tropical forest management. In the same period, the rights of indigenous peoples also garnered attention and were integrated into the agenda of key transnational development institutions. During the conceptualization of specific projects, there may be simultaneous formation and expansion of the national and sub-national institutions involved.

Negotiation involves the definition of the projects' structures, including the actors and governance scales. During negotiation, various scales interact to advance the project, but each scale defends their best interests as well. Since the cases under review were first defined outside the village, cooperation and competition first occurred among intermediary and upper governance scales. Village groups were not included until territorial competition was resolved among higher scales. During the negotiation stage, linkages are often established in local project sites. Participatory appraisals and local project approval may not occur until late negotiation, although in my case studies these processes were sometimes completed as late as the implementation stage.

International donors are powerful during the conceptualization and negotiation stages as they can employ conditional lending techniques, meaning that they insist on change before releasing funds. This power continues into the implementation stage because a donor can threaten to discontinue funding, but once they have financially supported a project, it gains momentum. It reflects poorly on donor institutions when they halt projects already under their sponsorship.

During the implementation stage, all project scales are generally involved, although not necessary equally. Local input often remains limited as implementation initiates, but a physical presence may be felt in the target village, municipality, or district. At initial stages of implementation, conflict is common in community forestry. Conflict over resource sharing, equity, and benefit may increase (Nayak 2003) and power struggles may grow. Support for the projects and their objectives are expected to increase at all scales during early implementation as these conflicts are addressed, although new conflicts may arise at any point during the project cycle. Considerable attention during

early implementation is focused on garnering support in the impacted villages and gaining positive publicity for partners, such as the state and donors.

The cases in my research were being negotiated and initiating while I was in the field and, therefore, a post-implementation stage was not evident. The biological corridor project was in a later stage of implementation during my fieldwork, although processes in Prinzapolka were just initiating. In some cases, donors commit to medium or long-term support, although responsibilities are gradually transferred to the local level. In other cases, local populations are expected to take over project administration more quickly. The trend in international development is towards roughly five years of project assistance to be negotiated at the onset of a project, although in some cases budgets for one or two years are initially defined. Supplementary funds and support may later be granted, but larger funding cycles are generally not defined in earlier stages to reduce the potential for external dependency. Whether additional support is given or not, discontinuation of projects continues to be a risk. Even projects in post-implementation can stall or disintegrate due to conflicts among and within scales and sectors or the lack of adequate funding among other factors.

Delineation of stages during analysis, as I have done in Chapter Six, contributes to an understanding of the important role of time. For example, in participatory development, it is important that local groups are consulted *and* their input must occur early enough to influence the potential project direction. Donor or state funding cycles may greatly influence projects transitioning from stage to stage.

My supplemental case studies are not broken down into stages, although the above depictions generally apply, as their progress is not treated in as much detail. These

cases include Forest Stewardship Council (FSC) certified forestry and community sawmills, which meld social justice, environmental, and pro-business objectives. Certification demonstrates non-state, market-oriented governance (Cashore 2002; Cashore et al. 2004). Another global network, the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), is state-centered, although there are nongovernmental partners. Both FSC and CITES are large-scale, polycentric environmental networks intertwined with global trade. These two networks must be transnational to address their goals as they target both export and import countries.

CITES' controls over big-leaf mahogany are different than the other project models because they are policy-oriented, rather than focusing on a particular project or forest extraction plan. Unlike the other case studies, CITES has national coverage and, therefore, includes all areas outside of the Autonomous Region, although the majority of big-leaf mahogany originates from the Caribbean. However, there are significant similarities and interconnections. First, CITES focuses on exportation and is therefore trade and commerce-related. Second, it is large-scale: CITES involves all source and import countries for target species. Third, CITES is governed by a network of state, NGO, and private institutions. Fourth, there are charges that CITES' listings are influenced by politics, value judgments, and partial data (e. g., Hemley 1994; Blaikie 1995a), which fits with my overall critique of the social construction of environmental problems and solutions. Fifth, like the other models under review, initial implementation of CITES' new mahogany policy could be observed during 2002-2003 fieldwork. Lastly, CITES' success or failure will have implications for sustainable forest management in Prinzapolka, as well as the entire nation.

RESEARCH METHODS

I traveled to the RAAN periodically over the seven years prior to my extended fieldwork. I first visited Alamikangban, my main fieldwork site, in 2000 when I met with the village Elder Council to assure that my research was welcome. The day I arrived, a significant portion of the village was gathered at the courthouse protesting the activities of a logging company on communal land, which confirmed for me the importance of my proposed research.

In January of 2002, I began twenty months of fieldwork focused on Alamikangban and smaller surrounding villages. Alamikangban was the seat of Prinzapolka since 1997, but it continued to be remote. The village was located at the end of thirty-four kilometers of a muddy road that intersected a washboard dirt road leading to other RAAN towns. I soon understood what it was like to be “rained in” when Alamikangban’s entrance was impassable to vehicles for weeks on end. Villagers frequently blamed the poor condition of the road on logging companies because trucks created large ruts and mud pits.

Throughout 2002 I participated in and observed a wide range of village and municipal meetings, conducted interviews with local leaders and officials, and informally conversed with villagers. Logging and forest activities were frequently discussed. Some public meetings and interviews were tape recorded and later transcribed, but in general I relied on profuse note-taking. Nearly all interviews and many public meetings were conducted in Spanish. My comprehension of the Miskitu language was sufficient that I could follow conversations and meetings. Most meetings in Alamikangban were

conducted in a mixture of Spanish and Miskitu, or orally translated from one of the languages to the other, depending on the core audience.

In October of 2002, I completed fifty household surveys, which signified coverage of thirty percent of the houses of Alamikangban. My research assistant, the high school science teacher, administered the survey in Miskitu while I listened and took notes. He and I developed the eighteen questions together. Although they were structured in yes/no, true/false, and multiple choice formats, we allowed people to answer at length when they chose. Interviews ranged between fifteen and forty-five minutes. Households were selected randomly and all village neighborhoods were included.¹⁷ The questions and responses to the survey are located in Appendix Two. In November of 2002, I documented local forest use with loggers, agriculturalists, ranchers, boat builders, carpenters, fisherman, hunters, gatherers, and other male and female community members. I compiled a list of commonly utilized tree species and their uses, as shown in Appendix One.

My fieldwork documented a major transition in the study area. Through 2002, state policy was the dominant instrument regulating forest management. By late 2002, it became clear that several international agencies would enter with multi-million dollar forest development initiatives. Living in Alamikangban, I experienced this incursion the way that local villagers did. One day, project representatives arrived and called a meeting where they basically stated, “We have chosen to develop you and your forests.”

The second year of fieldwork in 2003 was used to document new projects and actors. By 2003, I had observed that considerable information did not reach the village

¹⁷ Since my target coverage was thirty percent, we completed a survey in every third house.

level and I started to spend more time in Bilwi and Managua. Bilwi, the capital of RAAN, is located approximately two hundred kilometers by road from Alamikangban. I interviewed regional government officials and participants in a range of forest sector activities. In the nation's capital city of Managua, I interviewed officials in the National Forestry Institute and other commerce and natural resource ministries. I spoke with foreign donors and representatives of aid agencies, such as USAID and the World Bank, which were stationed in Nicaragua.

Table 1 demonstrates the different scales targeted in my 287 interviews. I categorized each based on the primary locale or scale of identification of the interviewee, although some interviews addressed cross-scale interactions.

TABLE 1
Interview Scales

Scale	Number	Percentage
Village	73	25.4%
Regional	63	22.0%
National	58	20.2%
International	49	17.1%
Municipal	35	12.2%
Village Bloc	9	3.1%
TOTAL	287	100%

The greatest number of interviews was carried out with villagers, followed by the regional, national, and international levels. The percentage of the total interviews at these four key scales ranged from seventeen to twenty-five percent. The two largest groups coincide with the fact that I spent the greatest length of time in Alamikangban and Bilwi. The smaller number of interviews at municipal and village bloc scales correlates to the

fact that there were fewer total representatives at these levels, and they were less important in many of the cases studies under review.

Admittedly, my interview coverage is skewed toward the local and regional scales. In spite of the fact there are a larger number of representatives at the national and international levels, and therefore a larger sample size, I had fewer interviews at these scales. Nevertheless, I targeted the most important national and international officials for the information I required. In addition, the perspectives and activities of individuals at higher levels were more often available in secondary sources, such as press articles and public reports, whereas it was less likely for local or regional positions to be documented elsewhere. Thus, my bias toward local and regional actors counterbalanced other sources that tended to prioritize national or global scales.

Upon departure from Nicaragua, I perceived my coverage of the international scale to be insufficient, even though I had contact with a range of international donors and transnational organizations in Managua. I supplemented my fieldwork results with a second stage of research upon my return to the U.S. in December, 2003. I carried out internet and library research on donor agencies, environmental organizations, and international agreements related to forest governance. Donor reports proved to be particularly valuable sources of information.

Throughout fieldwork, I spoke with foresters, loggers, lumber inspectors, lumber intermediaries, logging company owners, journalists, state officials, NGO personnel, development project representatives, scientists, professors, cartographers, indigenous rights lawyers, civil war ex-combatants, pastors, teachers, elders, communal leaders, and village members. Interviews are listed by institution in Appendix Three. Due to the

controversial, and at times illicit, nature of the events observed, pseudonyms have been provided in the text for all individuals, with the exception of a few key state officials. If there were different organizational scales within the same institution, I attempted to talk to people at multiple levels. There was also a high rate of repeat interviews whereby I returned to speak to helpful sources. I visited twenty libraries, archives, and documentation centers in Managua, Bilwi, and Alamikangban. These are also listed in Appendix Three. Project development proposals and forest management plans were especially helpful secondary data sources.

Table 2 breaks down interviews by sector. I had the largest number of interviews with communal actors. The second largest sector was state officials, followed by NGO representatives, including university faculty. The private sector included business owners, intermediaries, and individual loggers. The category “other” was made up of journalists, cartographers, and lawyers.

TABLE 2

Interview Sectors

Sector	Number	Percentage
Communal	88	30.7%
State	83	28.9%
NGO	63	22.0%
Private	47	16.3%
Other	6	2.1%
TOTAL	287	100%

My fieldwork methods can be categorized as both progressive contextualization and multi-sited ethnography. During progressive contextualization, the researcher explains human-environment interactions by placing them in progressively wider

contexts (Vayda 1983). I started in one village and began tracing the networks associated with forest development. After defining sub-national and national actors, I found myself linking to global institutions. This study progressively moved up in scale from household and village analysis in 2002 to discussion of institutions working in hundreds of countries, like the World Bank and CITES, in 2004 and 2005.

Multi-sited ethnography is essentially a comparative method. Using Alamikangban as a base, I compared processes in this village with what was occurring in other Miskitu villages in the municipality. For example, Chapters Four and Seven describe events in Tungla, Las Crucetas, and Layasiksa, which are shown in Map 2. Ethnographic methods are not limited to rural research. In Nicaragua, sensitivity to racial and ethnic differences between semi-urban and urban locations, such as Managua and Bilwi, is also important. There are distinct cultures in eastern and western Nicaragua in terms of language, religion, and history, as well as racial and ethnic differences.

Case studies can depict dynamic relationships between key institutions at multiple scales. The comparison of ten transnational cases suggested patterns of action in response to conservation and development policies. Comparative methods are often utilized when the sample size is too small for statistical analysis (Ragin 1987). Although poorly equipped for testing hypotheses, comparative methods are a helpful heuristic device to stimulate analysis (Lijphart 1975).

In choosing my case studies, my goal was to demonstrate a range of experiences. I looked at all ten forest management initiatives with transnational linkages that existed

within Prinzapolka.¹⁸ There were important consistencies throughout all the core and supplementary case studies. First, all were donor, corporation, or state-initiated, meaning that the impetus for the project did not come from the recipient village(s). This is common in international development. Second, all projects had international sponsors who provided training and/or funding. Third, each was influenced by global conservation trends. Whether the project focused on biological corridors, genetic conservation, gene improvement, seed banking, carbon sequestration, community entrepreneurship, indigenous forestry, ecotourism, or certified forest management, each model was vogue in international development circles. Fourth, each project included elements of natural resource marketing. Fifth, each project involved upward and downward shifts in governance scale. Lastly, each project was located on what was claimed as communal indigenous land, although it often remained untitled. I deepened analysis of three cases of this larger sample because they met two additional criteria. First, each project initiated activities in Prinzapolka during the fieldwork period. Second, I was able to observe project negotiations with local populations from Alamikangban where I was stationed.

This study covers contemporary periods. Historical political ecology in eastern Nicaragua is challenging (Offen 2004). Early records of forest activities are fragmentary (Weaver and Bauer 2000). The general lack of accurate statistics makes analysis difficult and casts some doubts on its reliability (BCN 1975; Weaver and Bauer 2000). I do not attempt to construct an in-depth historical account of logging or to claim to be an expert

¹⁸ In 2004, a project called EcoTimber, located in the far east of the municipality at the mouth of the Prinzapolka River, was being negotiated. Company executives from the U.S. were looking for investment partners. They initiated a SmartWood forest management unit certification process after negotiating a parcel with local populations. I do not cover this project because it initiated after my fieldwork.

on the Moskitia's earlier history (but see Dozier 1985 and Naylor 1989). For detailed historical accounts of Miskitu governance, see von Oertzen et al. (1990) and Offen (1998). Corporate extraction is covered in Parsons (1955), BCN (1975), Vilas (1990), and Vernoooy et al. (1991).

In presenting this story, there is one element that I have not completed to my satisfaction. I have not visually demonstrated the spatial relations of different actors in this work as I initially intended. When I began analyzing scale literature, I naïvely wondered why few studies used visual aids, such as diagrams, to demonstrate the connections discussed in their institutional analysis. I planned to include diagrams, but I wanted to get around pyramid or chain approaches, which reduce processes and actors to boxes and lines and tend toward hierarchical or linear depictions.

I began many unsuccessful attempts to visually depict the interrelated scales and networks in my case studies. I initially incorrectly assumed that I was analyzing distinct case studies made up of discrete scales from the local to the global, but I soon discovered interpenetrating scales and actors. There were potentially infinite connections of varying degrees of importance. Where did I stop? How could I demonstrate simultaneous yet heterogeneous relations between actors? Is international a range of scales (e.g., bilateral, multilateral, regional, hemispheric, and global)? Can an institution as complex as the World Bank be reduced to a single entry in a diagram? How could I link all of the interacting partners and still consistently position the most powerful in the middle of a network diagram? How could I show institutional fluctuations and change across time? Without creating three-dimensional constructions in motion, I could not visually demonstrate dynamic and complex spatial relations as I ideally would have liked.

CHAPTER ONE

Scope and Epistemological Foundations

Several research traditions and academic fields are utilized in this study. The three parts that make up Chapter One cover geographical scales and networks, the political ecology of the forested commons, which integrates political ecology and common-pool resource management with forest ecology, and indigenous resource development as a particular mode of human-environment interaction exhibiting specific attributes and priorities.

PART ONE: GEOGRAPHICAL SCALES AND NETWORKS

Geographical scale is a vast topic. In order to focus on specific concerns most applicable to case studies analyzed later, the coverage was delineated strategically. Scale is depicted here as process-based, relational, and linked to power (*sensu* Swyngedouw 1997a, 1997b). I present important scalar debates on the role of the state, scalar fixes, and the conceptual use of hierarchies.

The introduction to network methodologies that follows presents the development of different configurations. The use of the network concept in geography is addressed in a comparison of scalar and network methodologies. I do not advocate one methodology over the other because there are strengths and limitations to each.

Scale in Human Geography

“The geographical imagination is most fully exercised when it wanders across a range of scales, teasing out the connective tissue that binds different levels of the local-to-global continuum together” (Meyer et al. 1992: 255).

“Scale is, arguably, geography’s core concept, for only through its resolution can we negotiate the boundaries between difference and similarity” (Herod 1991: 82).

These quotes demonstrate the complexity and significance of scale. Scale has been considered important in human geography for more than fifty years (Meyer et al. 1992). In recent decades, considerable research and writing have focused on understanding scale and its implication for social relations.

Scale is defined in numerous ways across various academic disciplines, such as geography, mathematics, ecology, economics, and political science. In physical geography and cartography, scale identifies precision, which serves to determine measurement or map distance. However, in human geography, scale is broadly interpreted as extent. It is understood as “the level of geographical resolution at which a given phenomenon is thought of, acted on or studied” (Agnew 1997: 100). Geographical scale, therefore, provides an organizational framework for defining boundaries related to social claims, activities, and behaviors (Blaikie and Brookfield 1987).

The treatment of scale in geography has changed fundamentally over recent decades. Historically, different scales such as nation, region, or locality were privileged in research. Current norms suggest that analysis should not focus on any specific scale as a starting point (Swyngedouw 1997a, 1997b; Harvey 2000). Vayda (1983) argued for a progressive contextualization to avoid a priori assumptions about institutions and their fixity. Multi-scale studies are now more common (e.g., Gibson-Graham 2002; Kurtz 2002), as are studies demonstrating flux (Smith 2004). The inclusion of multiple or fluid scales can greatly increase analytical complexity in research. Definitions, structures, and

processes related to scale politics constantly change; even the most sophisticated theories require on-going revision (Jonas 1994).

Prior to 1950, distinctions between levels of analysis served as a taxonomic device to distinguish study areas, degrees of generalization, and processes of causality. Scalar distinctions came to “masquerade as a theoretical principle” in various academic disciplines (Agnew 1993: 267). Focus was placed on determining the particular scale of greatest significance. Different disciplines and departments specialized in distinct scales. For example, international relations were divided from domestic politics. Micro- and macro-economics were split apart.

In the middle of the 1900s, ecological and social theorists dealt with similar concerns over scale because they realized that distinct inferences and relevant variables surfaced at different levels of analysis (Meentemeyer 1989; Meyer et al. 1992). Statisticians and sociologists identified confounding effects of scale in spatial analysis (McMaster and Sheppard 2004). The tendency for the correlation between two variables to increase in units of coarser resolution was identified as ecological fallacy (Gibson, Ostrom et al. 2000). It became recognized that it was not possible to determine relationships in lower scales from aggregate results at higher scales.

In geography, Bird (1956) referred to scalar difficulties in characterizing regions. Meanwhile, economic geographers McCarty et al. (1956: 16) stated, “Every change in scale will bring about the statement of a new problem, and there is no basis for assuming that associations existing at one spatial scale will also exist at another.” Similar findings were documented in physical geography. Haggett’s (1964) Brazilian study demonstrated

that the amount and distribution of forest cover correlated with different factors at various scales of analysis from the regional to the local.

During the first decades of scalar analysis in human geography, “[a]t best scale was invariant, at worst imaginary” (Herod 1991: 83). As the scale problem gained attention, alternative schemata were discussed to organize and differentiate political levels. For example, Haggett (1965) attempted to quantify scale by establishing an approximate size in miles, as well as map scale for political subdivisions such as “district,” “province,” “sub-region,” “region,” and “continent.” However, the idea that general rules could be established for the scale of political divisions did not last. Clearly, political units, such as a country, could be tiny like Singapore or large like Russia, making strict rules unhelpful (Howitt 1998).

A transition period occurred whereby scale was slowly transformed from a problem for geographical research to become seen as a strength within the discipline. First, it was necessary to change how scale was determined within research initiatives. Harvey (1968) proposed an iterative approach with analysis going from process to pattern, back to process. He believed that by working through the scale problem, geographers would pave the way for more penetrating analysis of the relationship between temporal process and spatial scale, but he suggested that only through actively engaging with a research question could the proper scale for each particular task be determined. Stone (1972) later suggested that the use of multiple scales could strengthen the discipline. He proposed that it was necessary to develop a methodological procedure to ensure that all scales were considered in early analytical stages of research.

In the 1980s, the treatment of scale received considerable attention and earlier notions were increasingly questioned in geography and related fields, such as anthropology (e.g., Vayda 1983). Prior to this period, scale was generally perceived as a neutral metric of physical space (Smith 1995). Often it was reduced to mean size. Scale was seen as absolute, with political scale working as a “container” or “platform” for social processes. Scales such as “urban,” “national,” or “global” were accepted as ontologically given (Herod 1991). Scales once perceived to be stable were later broadly transformed. In the early 1970s, it was generally thought that Europe’s eastern and western blocs, as well as individual nations, would not change (Smith 1995).

Once released from fixed areal notions, scalar theory evolved substantially. Attention shifted from merely defining scales to also depicting the processes working across scales. Wallerstein (1979) discussed vertical interactions between an elite upper stratum of core states, a middle level of semi-peripheral states, and a large periphery of exploited nations. Together these three levels formed the world economy. Taylor (1981, 1982) described a political economy of geographic scale based on material processes generated from capitalism. The global scale, which Taylor called the “scale of reality,” was contrasted with the national scale, or “scale of ideology.” These names were chosen because national ideologies filtered a global totality based on the international characteristic of accumulation. Lastly, the urban was the “scale of experience” because it was “the scale at which we live our daily lives” (Taylor 1982: 29). Likewise, for Smith (1984), focusing on the territorial division of labor, scales were actively produced in spatially uneven development. The global scale exhibited the universalization of wage labor due to capitalist production systems. The national level involved political control

over labor. The regional scale differentiated different production sectors, while the urban scale involved daily labor markets.

A key debate in the 1980s concerned the material existence of scale (Herod 2003). There was substantial disagreement as to whether scale existed as a material social product, or if it was merely a handy mental device to categorize and order the world. Neil Smith, and others, used Marxist ideas of materialism to argue that scales were real social products that emerged out of contradictions within capital. Smith and Dennis (1987) mapped the coalescence of a Northern manufacturing core in the United States. At the time of the article, they proposed that this core was in the process of fragmenting due to larger-scale economic and industrial shifts. Therefore, local issues, such as employment, were not really local at all because they were dependent on what occurred at other scales. Cox and Mair (1991) identified “local politics” as a misnomer because many of the social relationships resulted from a larger capitalist structure. They used the example of local labor issues to demonstrate how spatial and scale divisions were constantly restructured and, thus, scale was socially produced.

Scale is process-based. Downward governance shifts are occurring around the world. At least fifty countries currently claim to be decentralizing some aspect of natural resource management (Agrawal 2001a). Decentralization involves the transfer of governance processes from the central level (Rondinelli and Nellis 1986; Larson 2002). Deconcentration involves the handing over of responsibility to lower levels of central government. Devolution is the creation of distinct sub-national structures, such as an autonomous region or municipality. Delegation implies the transfer of responsibility to powers outside the normal governmental structure, like NGOs. During privatization, state

tasks transfer to private enterprise. While all four types of decentralization are evident in Nicaragua, this chapter focuses on deconcentration and devolution.

While questions remain on the subject of how exactly human scales are created, scales are understood as social constructions that reflect political and economic interests rather than neutral categories of geographical space. Scale is socially produced in an ongoing process involving a multiplicity of actors at different levels (Smith 1992, 1993; Jonas 1994; Delaney and Leitner 1997; Cox 1998; Howitt 1998; Marston 2000). Scales are constantly influenced by technological innovations, changing political institutions, and shifting economic structures (Harvey 2000). At the same time, scale is seen as generative because it facilitates and constrains certain actors or activities.

The politics of scale are “perpetually redefined, contested, and restructured in terms of their extent, content, relative importance, and interrelations” (Swyngedouw 1997b: 141). Important scale theorists, such as Swyngedouw, insist that focus should be on *mechanisms* of scale transformation and transgression. The making of geographical scale contributes to, as well as results from, conflict based on social differences in class, gender, race, and other forms of socio-political struggle (Smith 1992, 1993; Harvey 2000). Scale can be understood as the geographical resolution of contradictory social processes of competition and cooperation, homogenization and differentiation, and empowerment and disempowerment. As change occurs, interaction between cooperating and competing actors creates alternative spatial forms at new scales.

Globalization implies the functional integration and coordination of internationally dispersed activities (Gereffi 1999). Thus, since globalization works at a variety of spatial scales, I agree with Harvey (2000) that it is dangerous to act on an

interpretation of conflict based on any one particular scale. Even the most apparently local of local events reflects influences from other scales (Watts and McCarthy 1997; McDowell 2001). Thinking relationally about scale goes beyond binary categories of global and local (Peck 2002). In polarized and binary thinking, global is understood as strong, dominating, mobile, and active, while local is perceived as weak, acquiescent, stationary, and passive (Gibson-Graham 2002). Yet, understanding the world in terms of simplistic dualisms constrains our understanding of more complex scalar processes. Specific places may be constructed as both global and local without being wholly either (Herod and Wright 2002). Kelly (1997: 168) states:

[T]he global scale is constructed and constituted in the local, and the global in turn restructures the local. One is always implicated in the other. This is so because local political power can construct the imperatives of the global, mediate local experience of material global flows and, at the same time, legitimize local practices with reference to the globalized imperatives which it has constructed.

I concur that each scale makes most sense when studied in relation to others, and this requires moving beyond a discussion of global-local as there are many intermediary scales.

Too often a particular (for example local) or a bifurcated (for example global-local) geographical scale of analysis is used in ways that, in effect, preclude alternatives and that obscure the subtle variations within, and interconnections between, different scales. Thus, we often end up with an understanding of the global from the local or vice versa, where the automatic privileging of one particular scale over others becomes both a disabling obstacle to understanding and also a discursive justification for particular development strategies and political power relations (Dicken et al. 2001: 90).

Interests at different scales are not easily separated from one another and may be conceptualized as intertwined and fluid (Agnew 1997; Delaney and Leitner 1997). Over engagement with any particular scale, or excessive attention to the characteristics of the

scales themselves, inhibits a clear understanding of the *relationships between scales*, which should be the main focus (Swyngedouw 1997a, 1997b).

In my opinion, treating scale as a process-based and fluid phenomenon has led to important insights, such as the importance of interscalar linkages. It has also led to never-ending analytical complexity and an excess of scalar terminology. In literature on political scale, it is possible to become lost in ever-expanding levels and processes, such as body, household, community, local, extralocal, translocal, urban, regional, extraregional, sub-national, national, transnational, multinational, supranational, global-local, global, microscale, mesoscale, macroscale, metascale, transscalar, multiscalar, re-scaled, interscalar, downscaling, upscaling, jumping scale, globalization, localization, “glocalization,” and “glurbanization.” Confronted with this apparent cacophony of institutional arrangements, one is supposed to come away with a feeling for the interconnectedness of scalar relationships and yet appreciate the flux between co-evolving entities.

In the midst of ever-expanding theorization on scale and the subsequent production of scalar terminology, one may be tempted to throw up their hands in disgust and pronounce it all useless. Yet, since we live in a complex world, any intellectual attempt to understand and define multiscalar processes will struggle for coherency. This results from the refusal to artificially simplify processes to make them fit in a tidy package. The theoretical advancement in scalar studies discussed in previous paragraphs, in spite of the complexity of the subject matter, is remarkable. This progress is due to innovative thinking, combined with a sincere commitment to make theory applicable to

real life and to use scalar analysis to increase social justice (e.g., Smith 1992, 1993; Howitt 1993; Gibson-Graham 2002; Kurtz 2003).

Scale has a double edge. “By setting boundaries, scale can be constructed as a means of constraint and exclusion, a means of imposing identity, but a politics of scale can also become a weapon of expansion and inclusion, a means of enlarging identities” (Smith 1993: 78). Scale is not socially or politically neutral; it embodies and expresses power relations (Swyngedouw 1997a, 1997b). The terms “local,” “community,” “national,” or “global” are employed to legitimate a set of social relations based on particular political interests or agendas (Smith 1992, 1993). “[W]hat takes place at the local level may not be local politics at all but the localization of wider political games involving regional, national, or global actors who have found local venues to mine and local actors to express their interests” (Smith 1998: 40).

Actors situate themselves at different spatial scales as they attempt to shape and reshape the spatiality of power (Kurtz 2003). Hegemonic scales made up of dominant actors can force subordinate groups to be limited to particular activities at specific scales. Likewise, scale production can empower one group at the expense of another.

The most powerful agents are able to work at multiple scales (Swyngedouw 1997a, 1997b). There is frequently disjuncture between the level at which a problem is experienced and the political scale(s) at which it can be addressed (Williams 1999). Since different scales provide varying types and amounts of resources, weaker groups may not be able frame their argument in terms of the appropriate scale(s) necessary for the resolution of their problems. The powerful can manipulate scale to prevent access by specific groups. While this process often works across scale, it can also occur within the

same scale. For example, if there are two or more antagonists at the local level, each may seek to entrap their opponent at the local scale (Cox 1998). Strategic political action must be targeted across multiple levels of organization with attention to where efforts are most relevant (Williams 1999; Towers 2000).

Scale jumping appears necessary for social transformation to occur. Scale jumping is defined as devolving the constraints of spatial boundaries to be able to organize production and reproduction activities and resist exploitation and oppression from higher scales (Smith 1993: 90). The term scale “bending” or “stretching” may be more accurate as “jumping” implies that scales are, in fact, separate from the social processes that create them (Herod and Wright 2002). Herod and Wright also note that scale bending can happen in both directions as actors at different scales stretch up and down. “Jumping” is misleading because it may appear to refer only to upward movement.

Debates within Multi-scale Approaches

Although there is general consensus on scale politics as process-based relations intricately linked to power, there are important on-going disagreements. I do not attempt to resolve any debates here, but rather present diverging points of view which can be utilized later. The first key debate concerns the role of the state and whether it has been “hollowed out” (Jessop 1990, 1997) as a result of globalization. The second involves the existence, or lack thereof, of hierarchy among scales. Lastly, there is discord concerning the fixity or fluidity of scales.

Actors seek to function at the geographical or institutional scale that provides the most effective political opportunity structure. Which government authority, then, should exercise power over which territorial scale? Or market? If an individual feels that their

rights were violated, which of several different scales of regulation (e.g., international, national, regional) should one appeal to for recourse?

The international norm of state sovereignty requires clearly defined and bounded territorial spaces. A fundamental contrast continues between domestic and foreign affairs. Although there have been shifts in the areal coverage, and the recognition of some new countries, the state is often depicted as one of the more stable scalar entities as far as its extension. Nevertheless, the degree of change in state roles and responsibilities depends on whom you ask. Since the 1980s, there have been seemingly antithetical tendencies in theorizing about the state (Glassman 1999).

Peck and Tickell (1995: 24; emphasis in the original) propose that, “Processes continue to be significantly *articulated* at the level of the nation state, even if they are not exclusively *rooted* there.” Herb (1999) concurs and notes that states continue to dominate world politics and remain the only entities to hold sovereign power. In contrast, for another group of theorists, the power of the state is understood as dependant on supranational institutions and multinational corporations. As capital organizes itself in a global market, Smith (1993) concludes that the nation-state is a vulnerable scale of social organization. Some theorists propose that the state has been fundamentally restructured as a result of simultaneous political and economic globalization and decentralization, or what Swyngedouw (1997a, 1997b, 2000) and others have termed “glocalization.” Swyngedouw suggests that some power has shifted upward and downward in scale. Nevertheless, he believes that restructuring has not necessarily translated into a diminished role for the state apparatus. The spatial extent and level of the state’s control still largely influences the way in which other institutional forms operate. Swyngedouw

also discusses the exclusionary politics of quasi-state apparatuses, such as the G-7, and global institutions, like the North American Free Trade Agreement (NAFTA). The re-scaling of institutional forms, Swyngedouw believes, may actually allow states to become increasingly authoritarian, undemocratic, and repressive.

Some theorists suggest a shrinking of the state as processes move toward higher and lower governance scales (e.g., Swyngedouw 1997a, 1997b). While state restructuring in the south often includes decentralization, a strong state is necessary to transfer power and responsibility effectively to sub-national institutions (Larson and Ribot 2004). Simultaneously, I have observed that international aid campaigns aimed at institutional strengthening involve elements of state recentralization (author's fieldnotes). Within developing countries, numerous state institutions are created or enlarged to fulfill donor mandates. Meanwhile, bilateral and multilateral aid agencies are an influential extension of the state role in industrialized nations. Analysis of state re-scaling may need to be differentiated between processes in industrialized and developing nations. There are distinct roles for industrialized countries as donors and developing countries as aid recipients. Although the institutional structures are different, the state role in international development initiatives contradicts its reduction in both developed and developing nations.

In my experience, transnational "quasi-state" development institutions can broaden state control. Many exist parallel to traditional state institutions. An example is the Environmental Project for the Region of Central American (Proarca), which is funded by the United States Agency for International Development. Proarca promotes the Mesoamerican Biological Corridor in conjunction with the Central American

Environment and Development Commission, which is made up of heads of state, along with foreign affairs and environmental ministers. Non-state/state development partnerships are increasingly common.

Multi-scaled networks of quasi-state (e.g., aid agencies and development banks), state (e.g., central, regional, and municipal governments, ministries, and agencies), and non-state (e.g., nongovernmental organizations (NGOs), universities, corporations, and village representatives) institutions control access to, and management and utilization of, indigenous forest resources. I suggest that the abundance in international development of hybrid economic-political actors, such as the World Bank, contradicts a tendency in academic analysis to separate the political from the economic, or capital from the state. The need to integrate economic and political processes to analyze global forest development supports Cox's (2002) argument that their separation creates a false dichotomy. Speth (2003) views globalization as a type of compression that involves the tightening of economic, political, social, and environmental linkages between places. My findings are akin to this depiction.

Some theorists believe that the state role is diminished as a result of globalization. With sub-national structures increasingly linked to global processes, Agnew (1999: 190) states, "Development is increasingly a process determined by the relative ability of localities and regions within states to organize access to global networks. In this context, understanding power as if it is attached singularly and permanently to state territories makes little or no sense." While I agree with Agnew that sub-national structures have more international linkages, my research regarding the Nicaragua's regional government

will show that the central government continues to relay between higher and lower scales (author's fieldnotes).

In addition to being sensitive to shifts in the scales above the state, the roles of sub-national institutions are increasingly theorized. Jessop (1990, 1997), considered a leading authority on state power, believes that theorists need to look at the state in a more differentiated manner. First, the state has multiple boundaries due to the convergence of the various forces acting in and through it. The power of states can be understood as resting on power from below. The territorial state draws its power in a capillary fashion from social groups and institutions rather than simply imposing itself on them. Second, the state is the site of class-relevant struggle that creates internal contradictions. Third, the state is the site of rivalries among different units. I concur that state theory should be more aware of these types of heterogeneity.

There are diverse conceptions of autonomy in sub-national state structures. Ideas range from the notion that local states are merely a subservient and dependent lower tier of the central government to the proposal that local states exhibit a high degree of autonomy. Miller (1994) concludes that the degree of autonomy of the local state is contingent on many factors, including if one examines decision making processes or economic relations. Yet, it is often noted that decentralization requires the support of the central government, which has waxed and waned in the case of Nicaragua. During state devolution, the rule regimes that constrain and animate scalar agents often remain organized in higher spatial scales (Peck 2002). Morrill (1999: 5) discusses several arguments for the continuation of power at higher levels of government. Many of the

following points, as will be seen in discussions of regional and municipal governments, are valid concerns in Nicaragua.

- There are often externalities to processes at local scales.
- Decisions about local sites affect other sites and jurisdictions.
- The provision of public goods and infrastructure crosses jurisdictions.
- There is interdependence between localities because well-being often depends on cooperation with other places for jobs, goods, and services.
- Legal mandates at higher scales reinforce local authority to exercise powers.
- Local entities are often dependent on the economic and taxing resources of higher levels for portions of their budgets.
- There is greater political clout, mobilization capacity, and information dominance through media of interest groups at higher levels.
- People of local areas vary in attitudes; many look to higher levels to protect household or group interests.
- There is a perception that local governments can be parochial, selfish, or incompetent.

Nevertheless, Morrill (1999: 3) also counters these conclusions with a discussion of “the tyranny of distance.” It is both increasingly efficient and more respectful of local autonomy for some processes to be carried out in the smaller area that a particular process encompasses. However, with multiple scales of analysis, and rising global concern over local issues, there can be conflict over the boundaries of a particular process. For example, while local management may be proposed for a particular forest landscape, climate change and biodiversity concerns have pulled forest governance into

the international arena as local environmental services and species are seen as altering global conditions.

In the 1980s and 1990s, arguments justifying decentralization were broken down into two main camps.¹⁹ Decentralization was promoted to improve financial efficiency and increased administrative speed and flexibility or to increase democratic participation, including a framework for maintaining and strengthening regional or local ethnic identities. While the first type of decentralization was pressured from above by international donors, the second type was leveraged from below by local groups.

Another area in politics of scale analysis generating controversy is the relationship between the state and capital. Jessop (1990) argues that capitalist classes struggle through the institutions of the state to create the conditions for the reproduction of capitalism because these conditions cannot be guaranteed by the market itself. Cox (2002) goes one step further to unite state and capital. He believes that it creates a false dichotomy between the two to argue whether or not capital has undermined state power. State and capital do not simply act upon one another as two co-existing complexes – state and capital exist in a contradictory unity. My research coincides with this finding.

¹⁹ There are multiple reasons why decentralization is perceived to be beneficial. First, it is proposed to increase financial efficiency, administrative speed, and flexibility. Decentralization may improve the implementation of projects by reducing overload and congestion. Second, decentralization may increase democratic participation (IDB 1997). Third, decentralization may improve distribution because local governments are more likely to understand the needs and desires of the population. Central governments may not be able to monitor deterioration in infrastructure as easily as local governments (Rondinelli and Nellis 1986). Fourth, decentralization may provide a framework for improved regional planning and development (Morris 1992). Fifth, decentralized natural resource management may be beneficial because local planners might be more aware of socially acceptable means of environmental protection and regulation (Wapner 1996). Lastly, decentralization is seen as a positive framework for maintaining and strengthening regional ethnic identities (Ortega Hegg 1994; Díaz-Polanco and López y Rivas 1992). Autonomy is the most extreme form of decentralization and occurs most commonly in regions where the culture and history is distinct from the center (Morris 1992).

As globalization advances, the role of the state in economic institutions may sometimes be camouflaged. Cox (1998) discusses how the U. S. government dominates international organizations, such as the World Bank and the International Monetary Fund. In this sense, globalization has increased state power, but this connection is not always apparent due to the formation of new quasi-state, multi-scale political and financial institutions. Cox (1998) notes an additional paradox that while states increasingly lose control over their own internal economies as a result of global monetary interconnections, they struggle to influence the formulation of a policy environment that advantages their own multinational corporations working abroad.

Analytical unification of state and capital is not supported by all theorists. Purcell (2003) argues that narrow focus on the productive relations of capital in politics of scale literature creates a limited analysis of the state and state roles. Swyngedouw (2004) is one of just a few scale theorists who argue for increased engagement with questions of ecology and the environment. However, he relates this need back to his central political economy argument stating that capitalism rests on generating wealth by transforming and commodifying nature. It is possible to argue, as I do later, that it is necessary to extend scalar analysis beyond the realms of state and capital, although these processes remain linked, to look at issues of human rights, political autonomy, and subsistence in resource development issues. This argument is somewhat akin to Marston (2000), who argues for greater attention to reproduction and consumption processes during re-scaling. Marston also advocates for increased analysis of forms of social domination, such as patriarchy and racism, in discussions of capitalist production and the state.

After reviewing the literature, I conclude that the role of the state is complex and hard to theorize. Whether governments have been hollowed out, widened, strengthened, or weakened may be contingent on the specific economic, political, socio-cultural, or ecological process under evaluation. It may also be necessary to look at the internal and external roles of a particular state *before* undergoing “glocalization” transitions. It may be possible for some governments to have widened their mandates and yet be weaker than they were previously. Other governments may have become increasingly hollow and yet, they may be stronger. Actors at the same spatial scale, such as central governments, have uneven access to resources of power, money, information, and time and, therefore, are unlikely to have changed in the same fashion. While it is helpful to ponder a multiplicity of ideas on the role of the state, it seems unlikely that it will be possible to determine a particular state theory that will represent each country and every potential change. In contrast to earlier critiques of globalization as having a homogenizing effect, which to a degree it arguably can because it requires similar economic, political, and ecological restructuring for all cultures, races, localities, regions, and states to enter global institutions and markets, more nuanced studies now also discuss hyperdifferentiation imposed through globalization (Grant and Nijman 2004). Hyperdifferentiation, goes beyond earlier notions of unequal geographical development (see Harvey 1982, 2000 and Smith 1984), although Smith (1995: 75) discusses the continual redifferentiation of space. While agreeing with the general concept of economic divergence across space as the result of capitalism, Grant and Nijman argue that there are greater development gaps created by the high mobility of capital in places where there is also rapid change from state interference in markets to laissez-faire policy. Due to the simultaneous

implementation of multi-level reforms, there is a synergistic impact on spatial differentiation. While Grant and Nijman focus on inequalities among and within sub-national regions and urban centers, it is possible that as more research focuses on the differences created by globalization and the synergies of different reforms that there will be more examples of hyperdifferentiation and broader use of the term. There may also be the adaptation of other terms to differentiate new patterns and processes of unequal geographical development relevant to multiple scales. Amin (1997: 129) notes, “It is the resulting interconnectedness, multiplexity, and hybridization of social life at every level – spatial and organization – that [is] perhaps the most distinctive aspect of contemporary globalization.”

As this section and the following two sections demonstrate, it is unlikely that consensus can be negotiated within several scale-related debates. Purcell (2003: 317) suggests that “islands of practice” emerge due to habitual focus on specific perspectives and topics: “Scholars become embedded in a research and writing tradition that limits their intellectual and political horizons.” I think that in a world of uneven, extreme, and rapid transition, the key question may no longer be if states have become hollowed out or not. Defining a variety of new spatial patterns related to state roles may be more relevant than a universal theory depicting similar processes amongst all states.

Given the fluidity, relationality, and interpenetration between scales, can they exist hierarchically? Howitt (1998) is not alone in insisting that scale is best understood dialectically. In this view, all scales should be treated on a level playing field. Theorists often use the example of Mexico’s Zapatistas to demonstrate how what was initially a local or regional movement came to have national and international implications (Harvey

2000; Sheppard and McMaster 2004). Nevertheless, many theorists propose that the use of a hierarchy continues to be accurate. Brenner (2000: 600, emphasis in original) describes:

A process of scaling through which multiple spatial units are established, differentiated, hierarchized and, under certain conditions, rejigged, reorganized and recalibrated in relation to one another. Here, then, geographical scale is understood primarily as a modality of *hierarchization* and *rehierchization* through which processes of sociospatial differentiation unfold both material and discursively.

Smith (1993: 101) states, “[g]eographical scale is hierarchically produced as part of the social and cultural, economic and political, landscapes of contemporary capitalism and patriarchy.” Likewise, Harvey (2000: 75) concludes that what happens at any one scale “cannot be understood outside the nested relationships that exist across a hierarchy of scales.” Harvey, employing the example of the Zapatistas, shows that they have been deeply influenced by colonizing and capitalistic processes over time. The Zapatistas, he concludes, appeal to the international concepts of dignity and universal human rights using modern, global telecommunication networks, and yet dialectically call for autonomy based on their particular localized socio-ecological history.

For Kelly (1997: 168) globalization “represents a powerful icon that creates a particular construction of the necessities which must be attended to for development to occur. At different scales, from the national, to the provincial, to the municipal, political choices are legitimized by deferral to the global scale.” While institutions functioning at higher scales are not *necessarily* more powerful, this is often the case. “To fail to recognize this basic asymmetry in scalar power relations under conditions of neoliberalized competition – and the scalar hierarchies that these entrenched yet

institutionally specific conditions imply – is to run the risk of confusing theoretical correctness with political-economic reality” (Peck 2002: 339).

Kelly (1997) argues, and I agree, that globalization forms a material set of processes along with a political discourse used to legitimate certain power relations. The discourse of globalization is used to legitimize an economic and political agenda based on international investment flows and production for export. With a similar argument, McAfee (1999) describes interplay in eco-economic governance among three forms of power: economic power, institutional power, and discursive power. The economic power of advanced capitalist states and transnational corporations is reinforced by the institutional power of multilateral finance and policy. Economic and institutional power structures are then further strengthened by an economic-environmental paradigm that maintains a separation between environmental problems and broader political-economic issues. Therefore, the solutions to ecological problems are not major socio-structural transitions in existing political institutions, distributions of economic power, or patterns of resource flows, but rather technological and market-based models that build on and intensify gross economic and power inequalities.

Many theorists argue strongly that hierarchies continue and could even be strengthening. My research in Nicaragua demonstrates a continuation of hierarchies, but also suggests the need for more nuanced approaches to understanding power within multi-scaled networks (author’s fieldnotes). While Brenner (2001: 606) formulates scale hierarchically, he specifies that, “Processes of scalar structuration do not produce a single nested scalar hierarchy, an absolute pyramid of neatly interlocking scales, but are better understood as a mosaic of unevenly superimposed and densely interlayered scalar

geometries.” It must be possible to recognize power inequities without falling prey to overly structuralized conceptual traps that erase the role of agency and decision making processes. This is the value of actor-oriented approaches advocated in political ecology (see Bryant and Bailey (1997)). Multi-scale case studies, such as my own research, demonstrate diverse actors formulating decisions and acting at various levels. While it may still be argued that their choices are limited by dominant economic or political structures, their power to act, or even to not act, must be theorized to avoid simplified and excessively structural cause and effect relations.

Swyngedouw (1997a, 1997b) criticizes oppositional movements because of their inability to work across scales due to militant particularism. Keck and Sikkink’s (1998) work on transnational advocacy networks counters this overgeneralization. Opposition groups that are able to organize transnationally utilize networks to make change in their own country through a “boomerang pattern.” “Voices that are suppressed in their own societies may find that networks can project and amplify their concerns into an international arena, which in turn can echo back into their own countries” (Keck and Sikkink 1998: x).

Despite numerous differences, according to Keck and Sikkink, transnational advocacy networks are similar due to the centrality of values or principled ideas, the belief that individuals can make a difference, and the creative use of information and sophisticated targeting strategies. Advocacy networks will be discussed further in later sections on network methodologies; they are mentioned here because I would like to counter the premise that local movements cannot scale up and suggest that the situations that contribute to the ability of local movements to bend scale to their advantage deserve

greater attention. Their utilization of numerous scales is a complex outcome of multi-scalar, multi-temporal, and multi-centric processes involving tensions between structure and agency at various positions. I think that examples of an individual agency are often overlooked in theoretical discussions and that the analysis of specific cases can help to highlight decision making and action at various local scales.

Swyngedouw (1997b: 141) states, “Spatial scales are never fixed.” Many theorists agree with Swyngedouw that scale is a temporary sociospatial compromise. My own research results from Nicaragua demonstrate considerable flux (author’s fieldnotes). Yet, in spite of the stress on fluidity, it is also frequently recognized that some solidification may occur. I agree, especially with relation to higher scales. The dialectic between fixity and motion requires attention (Smith 1995; Brenner 1998). Smith (1995: 69; italics in original) states, “Capital and information are never entirely free of place, and spatial fluidity is only ever achieved via a parallel and deepening *spatial fixity* which at crucial moments reasserts itself.” Smith provides examples such as control nodes in economic or telecommunication networks strategically located in the industrialized north that define degrees of inclusion and exclusion as well as the sources, destinations, and configurations of information. He concludes that the fluidity of space is premised upon traditional spatial fixities and that this has serious implications for less powerful actors.

[T]he spaces of vulnerability for capital and for the informational organizations dominated by capital, emerge more often than not when power (capital, information, knowledge, skills) is necessarily fixed, brought back to ground, from within and as part of this space of flows. For this reason, whatever the undeniable fluidity of space, it is politically vital that our theorizations pay special attention to spatial fixity and the continual redifferentiation of space (Smith 1995: 75).

Building on Smith, Brenner (1998) further defines scalar fixes as hierarchical patterns of interdependence formulated by the circulation of capital as it is territorialized,

detrterritorialized, and reterritorialized. In spatial fixes, some actors, scales, and activities predominate over others. A risk ensues that once fixes are established (Brenner 2001), or even recognized (McDowell 2001), they may constrain the subsequent evolution of new scalar processes or configurations. For example, the depiction of the global scale as an all-determining and politically impervious metascale disempowers actors working at national or sub-national scales (Peck 2002). McDowell (2001: 231) notes, “The sedimentation of particular hierarchies tends to blind analysts both to alternative ways of theorizing the connections that define and link scales, reinforcing current hierarchies of power and social inequality, as well as alternative ways of organizing economic and social institutions.” Is it possible to identify and address scalar fixes or hierarchies without further advancing the discursive power of advantaged actors within these configurations?

Due to the fact that language and metaphors can influence conceptualizations of the world (Smith and Katz 1993), geographers have gone to great lengths to determine an appropriate depiction of scale (Herod and Wright 2002; Herod 2003). Early notions of scale, as rungs on a ladder, were criticized because they separated each scale in a fixed position, in spite of interconnections depicted by the sidepieces, and because they generally placed the global at the top and the local at the bottom. Other popular metaphors were a series of interlaying concentric circles or Matryoshka dolls. However, these depictions were criticized because each scale was bound and contained within the one above.

The use of a network metaphor can create a very different conceptualization of the world (Herod and Wright 2002; Herod 2003). It is possible to depict scale as the root

system of a tree in which roots overlap and are intertwined through different strata of soil. Some roots lie deeper than others, but within the network as a whole, it can be difficult to define precisely where the boundary of one layer of roots begins and ends. It is possible for surface roots to move deeper into the soil and for deeper roots to send shoots towards the surface. Using a root metaphor, the ideas of higher and lower scales, or that one scale can encompass another, are less relevant. Herod and Wright (2002) stress that they are not proposing the use of one particular metaphor over another, but rather suggest that theorists should recognize that each metaphor represents a different way of understanding and depicting the world.

In accordance with the idea that metaphorical constructions depicting the world can shape our understanding of social processes, my study employs both scale and network metaphors to demonstrate a broader range of political and economic interconnections. Neither scalar nor network methodologies are promoted here as preferable overall. As each accentuates different aspects of the world, using both helps move beyond the limitations of either when used in isolation. The following sections introduce the network methodology and its utilization in human geography. The chapter conclusion discusses the strengths and weaknesses of both scalar and network methodologies.

Network Configurations

Akin to the ample usage of scale, network configurations have been widely identified in many academic fields. Utilization of network thinking has arisen in sociology, business economics, communications, transportation, urban studies, landscape ecology, and numerous other areas of study. The most prominent network theorists,

Latour (1993, 1999) and Castells (1996), focus on highly distinct aspects of networks. While popular frameworks that employ networks may initially seem to have little in common, network methodologies are attractive in a range of contexts due to the ability to focus on flow, connectivities, mutual interdependence, porosity, and unboundedness. Networks refute simple hierarchies and exhibit the unevenness or messiness of both technological and human relations. Networks may even bridge or transcend dualisms such as non-human/human, nature/society, global/local, structure/agent, public/private, and non-state/state. After briefly summarizing some of the ways how these theoretical characteristics have developed in other fields, I will discuss how they have been employed in human geography.

Hopkins and Wallerstein (1986: 159) define a commodity chain as “a network of labor and production processes whose end result is a finished commodity.” The conceptual roots of this approach are tied to world systems theory. Analysis is often linked to how resources from peripheral regions are transformed into commodities for retail and consumption in core countries (Hughes 2000). According to sociologist Gary Gereffi (1995, 1999), one of the strongest supporters of using a commodity chain approach to organize the study of economic globalization, with chains referring to the whole range of activities related to the global sourcing, production, and marketing of a product.

A global commodity chain methodology has been widely applied. For example, commodity chains have been utilized to examine the apparel industry (Gereffi 1999; Hassler 2004), agriculture (Mather 1999; Hughes 2000), and tourism (Clancy 1998). Commodity chains exhibit a series of nodes linked by various kinds of transactions. At

each node, the commodity is transformed and value is added (Talbot 1997). There is ongoing struggle for control of the chain through processes of territorialization and deterritorialization (Mather 1999) and interrelations of competition and cooperation (Hassler 2004). There is acknowledgement of heterogeneity and cross-national differences (Whitley 1996). Gereffi and Korzeniewicz (1994: 2) state, “These networks are situationally specific, socially constructed, and locally integrated, underscoring the social embeddedness of economic organization.”

According to Gereffi and Korzeniewicz (1994: 2), the commodity chain allows us to “forge the macro-micro links between processes that are generally assumed to be discretely contained within global, national, and local units of analysis.” Nonetheless, comparative analysis is still most often broken down nationally, with contrast between domestic and offshore sourcing. However, there is also considerable organization around firms or corporations which are generally multi-scaled and transnational.

In 1996, influential urban theorist Manuel Castells published a widely-read book called, “The Rise of the Network Society.” For Castells, a central factor in the shift toward an integrated, global “network society” is the expansion and development of information technologies and telecommunications. According to Castells, traditional spaces of places, such as cities, regions, and states, are being undermined by new spaces of flows. As a more pervasive and powerful space of flows is generated, there is increasing disjuncture between people’s everyday experience and the structural logic of the global economy (Latham 2002). Castells see localities as increasingly dependent on decisions of global elite that do not have allegiance to any particular place or nationality.

He concurs with a group of globalization theorists that there is a deterritorialization of governance (Leitner et al. 2002).

“The two extremes, local and global, are much less interesting than the intermediary arrangements that we are calling networks” (Latour 1993: 122). Bruno Latour is part of a group of French thinkers that bridge human-nature and global-local binaries (Simonsen 2004). Their worldview rejects human privilege as an agent and their utilization of networks allows for the conception of agency as based on a relational effect between humans and nonhumans. Latour is one of the most influential minds behind actor-network theory (ANT), which builds on this melding or hybridization between objects and humans, and focuses on actions or practices rather than structures. Non-human artifacts, such as resources, tools, or policies, enable social actors to develop and maintain relations at all scales via networks. Latour (1997: 5; quoted in Dicken et al. 2001) states:

The notion of the network allows us to dissolve the micro-macro distinction that has plagued social theory from inception. The whole metaphor of scales going from the individual, to the nation, through family, extended kin, groups, institutions etc. is replaced by a metaphor of connections... Instead of having to choose between the local and the global view, the notion of network allows us to think of a global entity—a highly connected one—which remains nevertheless continuously local.

Latour (1997: 3; quoted in Dicken et al. 2001) suggests, “Modern societies cannot be described without recognizing them as having a fibrous, thread-like, wiry, stringy, ropy, capillary character that is never captured by the notions of levels, layers, territories, spheres, categories, structure, systems.” Instead, there are multiple co-existing, cross-cutting networks of various length and durability. Murdoch (1997: 332) states, “Actor-

network theorists thus reject the view that social life is arranged into levels or tiers some of which determine what goes on in others; everything is kept at ‘ground level.’”

Transnational advocacy networks involve international actors that are bounded together by shared values, a common discourse, and dense exchanges of information and services. Networks, according to Keck and Sikkink (1998), are organizations that are characterized by voluntary, reciprocal, fluid, open, and horizontal patterns of communication and exchange. Human rights, women’s rights, and environmental campaigns clearly demonstrate transnational advocacy. In each of these areas, actors have been able to bring new ideas and discourses into policy debates and, therefore, pressure for change. Keck and Sikkink (1998) identify important network processes: agenda setting, criticizing discursive positions of states and international organizations, influencing institutional procedures, pressuring for policy changes in target actors, and swaying state behavior.

Keck and Sikkink (1998:122) state, “All advocacy networks challenge boundaries...International environmental campaigns generally raise claims about property (public and private) and sovereignty.” In their analysis of environmental networks, they describe anti-deforestation campaigns in Brazil and Malaysia, including how nongovernmental organizations at various scales were able to influence both multilateral lending policy and state policy and create a new script for sustainable forest management. However, they admit that while many actors have adopted the discourse of sustainable practices as a result of international campaigns, it is not clear the extent to which actual logging practices have changed.

While I find Keck and Sikkink's discussion of transnational advocacy networks useful, I propose that there are important ways that analysis could be extended. First, Keck and Sikkink focus on nongovernmental actors and their impact on the state. They justify this focus because they examine rights campaigns. While governments are the primary guarantors of human rights, they are also frequently violators of rights or liberties. Nevertheless, this focus artificially separates two of several intertwined actors without fully acknowledging additional actors or the connections between states, corporations, development banks, and international environmental organizations. They also do not discuss the linkages among public, private, and communal property evident in struggles over forest resources. Since states, private corporations, banks, nongovernmental, and civilian organizations are increasingly integrated, it is important to document the ways that these partnerships are both empowering and disempowering. Are actors more able to leverage for change, or is their activism compromised by these partnerships?

In 2004, Margaret Keck acknowledged that her understanding of network theory when she wrote in 1998 about transnational advocacy networks was insufficient.²⁰ In particular, she noted that the simultaneity of overlapping networks in terms of organizational levels and topics required greater attention. Actors can be members of multiple networks at the same time. Actors are not equally connected; rather there can be a continuum of connectivity. Issue areas (e.g., forest policy) cannot be addressed in isolation. Keck (2004) also criticized that earlier analysis of transnational advocacy

²⁰ Keck made these comments on October 9, 2004 in a panel discussion entitled "The Local in the Global: Latin American Social Movements Respond to Globalization" at the annual meeting of the Latin American Studies Association in Las Vegas, Nevada.

networks addressed space, but ignored the factor of time.²¹ It treated time as unproblematic and discussed actors and scales in the present without addressing how they had gotten there or where they were going. Temporal analysis of multiple processes and networks can identify important synergies that are not evident in more static analysis of present events structured around individual issues. Keck suggested that further exploration of complexity theory, network theory, and post structuralism would assist the analysis of transnational advocacy in the future.

Networks in Human Geography

In geography, the network configuration is gaining popularity as a social construct to depict complex human interactions. Several prominent scale theorists also utilize networks (Murdoch 1997; Cox 1998; Leitner et al. 2002; Leitner 2004; Taylor 2004). For example, Cox describes how organizations can construct networks with centers of social power that lie beyond their space of dependence. Geographers apply the network concept broadly and studies using this methodology analyze regional development (Cooke and Morgan 1993; Yeung 2000), power networks (Bridge 1997), business and production networks (Yeung 1994; Dicken and Hassler 2000), and commodity networks (Hughes 2000), among others areas.

Although not universally incorporated, some geographers utilize aspects of the four network frameworks described above. Herod (2003) suggests that Latour's notion of networks can help geographers to reconceptualize the global, local, and relationships between them. Latour's representations can also help to envision space as unbounded. Nevertheless, Paasi (2004) argues that while ideas about networks and associations are

²¹ See above footnote.

inspiring, Latour's ideas should not be taken too far. He quotes several passages from Latour that essentially propose that networks can free us from the tyranny of distance/proximity and the tyranny of geographers in defining space through mapping, measuring, and triangulating. Paasi (2004: 541) argues that networks do matter, but so do geography's boundaries and scales "as expressions of social practice, discourse and power."

Perhaps the greatest utilization of networks in geography exists in urban theorization. Building on Castells (1996), Taylor (2004: 231) states, "Quite simply, world cities cannot be contained within bounded spaces of any scale. Cities by their nature are networked, and their analysis should not be truncated." He believes that thinking in terms of global flows frees us from narrower "mosaic thinking."

Continents, regions, and nation-states constitute mosaic spaces, fully covering the maps that represent them. Cities are different because there are gaps between them. But they are not separate from each other: in these gaps there are flows, of people, commodities, information, and ideas, that connect cities. No city is an island (Taylor 2004: 214).

Noting similar global flows and spatial gaps in resource development projects, a network methodology can also be useful in rural contexts, such as the research described in later chapters. Nevertheless, geographers have some important critiques of Castells' version of globalization. First, Latham (2002) notes that it creates a unidirectional narrative whereby powerful global space of flows influence local processes. In addition, there is a somewhat romantic view of technology and communications networks that assign them considerably more mastery and infallibility than may be accurate. Further, Amin (1997) notes that by abstracting the space of flows from time and space, the local is presented as stable and culturally authentic prior to action resulting from global forces.

While requiring care to maintain temporal, spatial, and cultural sensitivity, I think that network methodologies have a role in geographical analysis of globalization because they are able to depict its messiness, unevenness in the penetration of areal forms, and the porosity of boundaries. To date, some of the most valuable engagement with this methodology is on the part of Dicken et al. (2001), Leitner et al. (2002), and Leitner 2004. Dicken et al. argue that networks are a foundational unit for analyzing the global economy because no specific scale or institutional locus is prioritized and individual scales are not treated as distinct entities. Building on commodity chains and actor-network theory, but not confining themselves to these frameworks, Dicken et al. describe a structural/relational network methodology that transcends various scales, but is sensitive to the geographical and organizational scales that social actors employ.

Networks are structural, in that the composition and interrelations of various networks constitute structural power relations, and they are relational because they are constituted by the interaction of variously powerful social actors... Thus while power is exercised within networks, networks themselves constitute structural power relations in which exclusions and inequalities exist (Dicken et al. 2001: 94-95).

Dicken et al. (2001: 95) argue for an actor-centered approach rather than focusing on institutions because “all organizations and institutions must be mediated through social actors in networks.” In doing so, they transcend dualisms, such as private versus public and firm versus state. Network methodologies incorporate these categories, but they are not treated as distinct entities and are not given ultimate causal power. The role of social actors is mediated through spatially and temporally constructed, heterogeneous actor-networks. In contrast to the ideas of Latour, these network relationships are embedded in particular spaces, but that does not mean that all social actors in each network must be bound together in exactly the same territory. The global economy is

made up of social actors engaged in relational networks within a variety of “spaces.” Network analysis can demonstrate the fundamental interrelatedness of geographical, sectoral, and organizational phenomena in a “seriously grounded form” (Dicken et al. 2001: 97).

A network methodology forces us to address the direct and indirect connectivities between economic activities stretched across geographical space but embedded in particular places. Thus, we have a mutually constitutive process: while networks are embedded within territories, territories are, at the same time, embedded into networks (Dicken et al. 2001: 97).

Dicken et al. (2001) argue that power should be conceived as a practice rather than an inscribed position. Networks are non-hierarchical, but still recognize and depict power inequities. The construction of networks of association depends on what centers of social power there are, whether or not leverage can be exercised over them, and whether or not it is worth trying to exercise leverage given their particular capacities (Cox 1998b: 43). Power is also evident in the ability to create, join, or escape networks. Powerful actors are those who drive networks and make things happen (Dicken et al. 2001). The ability for them to do this depends on their control of information and key physical, political, economic, social, and technological resources. Positionality (e.g., centrality) is often considered to influence power, as does the existence of associations between networks. At the same time, power and the intersection of various networks, influence the position of various players, as I will show in various case studies.

Although there have not been influential works published yet in geography, the application of a network methodology to environmental governance is instructive. Najam et al. (2004: 24) describe global environmental governance as “messy, non-linear, non-hierarchical, and intertwined.” In their analysis:

All sorts of actors interact with all sorts of other actors in all sorts of intricate ways. And sometimes they do not. There is rampant duplication, and actors sometimes act at cross-purposes. Common and clear goals are conspicuous by their absence and lines of command and control always murky. And yet the system as a whole is made richer by each of its parts...For those who value order and precision, this lack of neatness can be a disturbing symbol of inefficiency, redundancy, and a lack of focus. However, in the natural environment these very same qualities can contribute to ecological resilience. Arguably, environmental degradation cannot be addressed adequately but through a system of governance equal in complexity to the problems that need to be addressed.

While recognizing this complexity in the material world, and that overlaps often preclude categorical separation in reality, as a heuristic device, it is possible to group networks. Useful categories relevant to environmental governance have been suggested by Leitner et al. (2002) and Young (2002b). Types of cooperation that participants seek in networks can be broken down into thematic and territorial (Leitner et al. 2002). Thematic networks link together places with common problems regardless of location. For example, concerns over deforestation can engage villages in different parts of a nation with international environmental organizations. Territorial networks link places in a common geographical region or in particular types of regions. An example is the countries of the Amazon Basin. However, deforestation in the Amazon might interest networks with both thematic and territorial criteria. Differentiating these types of networks can be helpful in that it suggests outlets for cooperation. Long-distance thematic networks may best share information, expertise, or financial resources. Contiguous territorial networks have greater ability to actively cooperate on joint projects, such as the management of a shared watershed or forest ecosystem. In an alternative but related structure, functional interdependencies occur when two or more institutions address problems or activities that are linked in biogeophysical or socioeconomic terms (Young 2002b). These links occur whether sought after or not. An example would be the management of a river by

conjoined municipalities: one cannot improve water quality if the other is dumping toxic waste. Strategic links, by contrast, are forged by actors looking to forward an individual or collective goal. This conscious political interaction is in the interest of the groups involved because cooperation is perceived as being able to enhance institutional effectiveness.

Scales and Networks: A Comparative Overview

It is helpful to start with the similarities between the two perspectives *as they are utilized in human geography*; as the above sections demonstrate, there are fundamental differences in network concepts as theorized within other disciplines. First, both scales and networks are created as a product of human-environment interactions. Second, in both perspectives, the connections and relations between the scales and/or actors remain forefront. Third, both frameworks recognize transition and change: process-based analysis is central in scalar literature while network theorists discuss flows. Fourth, both theories struggle to move beyond dualisms, such as global/local and structure/agency. Fifth, each framework attempts to identify and embody the agents of the global economy to do away with a fatalistic, mechanized, or faceless conception of globalization. Sixth, both theories embrace complexity, whether through the utilization of multiple, intersecting scales and networks, or the density of linkages. Seventh, both frameworks address power inequalities: between scales this is often depicted with hierarchies; in networks, it can be demonstrated through positionality. Lastly, scalar and network geographers both advocate for the use of their theories to determine avenues for social change. Scalar stretching or jumping is more developed as a concept than similar ideas in network methodology, but network concepts are newer and surely will continue to

advance. However, generally, Leitner et al. (2002) note that networks may be utilized to challenge the dominance of certain scale configurations and dissipate centralized state or corporate control. Network governance can reinforce the power of decentralized structures and therefore transcend governance hierarchies.

Although there are similarities, scale and network perspectives are vastly different. “[P]olitics of scale is associated with vertical relations among nested territorially defined political entities; by contrast, networks span space rather than covering it, transgressing the boundaries that separate and define these political entities (Leitner 2004: 237). Case studies in Nicaragua demonstrate both institutions that cover specific territories and those that span space. There can be both characteristics within a single forest development project, suggesting that both scalar and network analysis are appropriate.

The portrayal of material governance scales is useful to demonstrate both fixity and transition in international development processes. While there is not agreement on issues of hierarchy, the scalar methodology clearly has been fruitful as a means to ponder and discuss unequal power. If one believes that hierarchies of power exist, scales are ideal to depict unequal levels of governance. Scalar configurations are well formulated for theoretical discussion involving the role of global actors, the state, and sub-national actors. Nevertheless, as several theorists argue, and I agree, that attention to the levels involved may oversimplify reality if the processes between scales are not given sufficient attention. Scalar theorists have been conscious to avoid this potential risk; however, I think that attention to the processes that link scales has been overwhelmingly focused on capitalism, which is no doubt crucial. Yet, in my opinion, it would be beneficial to

broaden analysis with increased inclusion of scalar connections related to governance institutions (e.g., law, policy), ecology, race, culture, gender, and other areas.

I propose that one of the strengths of employing a scalar methodology, which is not sufficiently addressed in geographical theory to date, is the utilization of horizontal linkages. Although Swyngedouw (1997a, 1997b) does discuss outward movements during processes of re-scaling, he is mainly concerned with outward linkages to private capital, which certainly are important, but are not the only type of sideways linkage. Oran Young (2002a, 2002b) and Fikret Berkes (2002), theorists who write on common property institutions and environmental governance, have outlined a much broader and highly practical notion of scalar linkages. Horizontal linkages occur across space, but at the same level of organization, such as cooperating villages, municipalities, or countries. In contrast, vertical linkages connect institutions at different spatial scales (e.g., local, regional, national, or international). There are clearly similarities with this verticality and concepts that are addressed in geography (e.g., scale stretching, scaling up, and scaling down). I return to the contributions of a broader analysis of horizontal linkages in the following section under common-pool resource management in the sections covering the nesting of multi-scale institutions and designing institutional-ecological fit.

Networks are made up of social actors who become mutually interdependent through economic, social, political, and cultural interactions (Leitner 2004). In my experience, network methodologies appear to better demonstrate interconnections than scalar configurations. However, perhaps the greatest risk with network analysis is that the emphasis on connections creates the danger of not understanding actors or the importance of place. If there is too much focus on the links between actors, there may be insufficient

understanding of the social characteristics that contribute to these relationships. Further, material, ecological, historical, and cultural contexts need to be understood. I am concerned that network methodology runs the risk of losing sight of geographical variations across localities and regions because it moves away from conceptualizing bounded regions. I think another risk arises from underplaying the role of the territorial state in global economic processes. For example, networks that cross international borders may need to address varied regulatory and socio-cultural environments.

I argue for the use of networks because they express hybridity well. Using this methodology, it is easy to reflect the integration of private, state, and nongovernmental institutions in environmental governance. Networks may also provide an opportunity to collapse longstanding dualisms between society and nature, global and local, and structure and agent because all can be integrated. By not reducing processes to categories such as global or local, networks avoid promoting dualistic or separatist thinking. In contrast, by organizing based on scale, scalar methodologies are more likely to become confused by “in-between scales” and what could loosely be identified as the relativity of scales (Cox 2002: 98). In-between scales are essentially hybrids that are neither one scale nor another, but rather a combination of two or more. The relativity of scales has to do with processes, for example, the scale division of labor, which could be considered national in one context and may be international or local in another.

I am aware that there is a vast range of networking structures that make it difficult to generalize about their effectiveness. Eccleston (1996) utilizes an interesting scheme for differentiating the degree of contact and coordination among associations. The lowest level of cooperation in a decentralized structure Eccleston terms “networking.” If

information sharing and regular communication among trusted contacts exist, networking is replaced by established “networks.” Greater cooperation on a joint campaign involving division of labor occurs among “coalitions,” while the greatest coordination is evident in “alliances.” Alliances involve long-term commitments between groups mediated through regular consultation. These words are often used interchangeably, and in my research I have generally stuck with the term “networks,” but a typology such as this may be helpful to demonstrate the range of cooperative structures that exist. In each structure, it is also important to evaluate power relations among members. Networks, alliances, and coalitions may be polycentric, or they may have a dominant core and less powerful periphery. Therefore, it is possible for there to be both polycentric and hierarchical relationships within the same network, as I will show in case study analysis.

In spite of the strengths of both scale and network perspectives, one of my key points is that it is likely that each must continue to advance in order to address the complexities of the world. Both configurations are socially-produced and thus subject to change. For Latham (2002), an analytical framework to theorize globalization needs to be able to demonstrate discontinuities along with connections and interdependencies. It should include both spatial and temporal scales. It must make sense of the small (and, I will add, intermediate) actors and transformations, as well as the large ones, and should not *a priori* assume that what is large is more important than what is small. It must be able to tell clear and relevant stories about the world that help distinguish the importance and positioning of relationships. So, how does each framework stand up to these tall demands? After applying these perspectives to my case studies, it will be possible to further analyze the strengths and limitations of each framework using concrete examples.

Scales and networks in human geography are ample topics and it was not possible to cover all valuable contributions. Moreover, scalar and network theories are only two of many relevant areas of research on political and economic globalization. There are extensive beneficial insights from political science, anthropology, environmental studies, and economics, among many other fields. Some of these contributions will be addressed in the following chapters; however, it is impossible to cover other disciplines with the same degree of attention granted to geography.

PART TWO: A POLITICAL ECOLOGY OF THE FORESTED COMMONS

Political ecology, common-pool resource management, and forest ecology are each highly diverse fields. My goal is to triangulate key aspects within each broader field of study, focusing on themes that are most relevant to my research. Since I select only a few prominent concerns, my work will not represent each field as a whole. Special care was given to synergies in the three bodies of literature under review and the integration between social and ecological process studies.

Due to an eclectic history, literature reviews attempting to cover the immense political ecology field quickly become overly general (Blaikie 1999). Nonetheless, several authors have developed analyses of the development and use of a political ecology approach. A discussion of the important intellectual genealogies of this pluralistic framework, such as ecological anthropology, cultural ecology, cultural geography, disaster research, and political economics, is found in Peet and Watts (1996) and Paulson et al. (2004). Robbins (2004) explores the contributions of many major works and addresses interrelated socio-ecological questions underlying key political ecology arguments. Offen (2004) discusses the central role of history in political ecology

and presents methods to make use of historical sources. He covers several works that successfully employ a historically grounded argument, which is challenging in developing countries where records are not always maintained. Zimmerer and Young (1998: 21) stress greater integration of environment, ecology, and physical sciences into political ecological analysis. In their view, the environment is not to be treated as a blank slate to be acted upon by human agents, but rather as “parts of a highly differentiated natural world made up of beings, matter, and processes whose existence is at least partly independent of our own.” Zimmerer and Young’s edited volume conveys examples of the complexity and flux of environmental change (see also Berry 1994), which demonstrates the utility of multiscalar and multitemporal analysis. Blaikie (1994: 23) summarizes general components found in many political ecology studies: a self-aware and critical approach to different epistemologies, ideologies, environmental information, and the research process itself; local socio-environmental histories, often covering long time periods; a variety of scales with explicit linkages between them; a concern with the state and its institutions; and, attention to conflict over resources in terms of the resources themselves, knowledge about them, and their meaning. In spite of these commonalities, Bryant and Bailey (1997) demonstrate the diversity existing even within a portion of the field in their discussion of Third World political ecology.

Bryant and Bailey (1997) outline five different approaches used by political ecologists. Although there is potential for overlap, distinctions can be made between analytical foci on environmental problems, concepts, regions, socio-economic characteristics, or actors. While recognizing the utility of each approach to address different research questions, Bryant and Bailey themselves chose an actor-based

approach because of applicability to multi-scale, multi-sector research problems. This approach examines key actors such as the state, multilateral institutions, businesses, NGOs, and grassroots actors. It aims to define the strengths and weaknesses of different groups in relation to one another while appreciating the heterogeneity within groups. In highlighting actors, and evidence of agency as they work in pursuit of particular interests, this approach counters earlier tendencies in political ecology towards structuralism. Recognizing the applicability to research on international development in the forested commons, the actor approach is used in my study.

A metaphor of a black box can be used when institutions are lumped into a homogeneous whole without attempts to differentiate and analyze their various components and interests. Although Blaikie (1994) asserts that the study of the state is important in political ecology, political ecologists need to go further in the understanding and depiction of state institutions (Robbins 2003). My findings support Robbins' conclusion. Explicitly, he (2003: 644) calls for convergence between an "everyday political ecology of the state" and "ethnographic exploration of institutions in nature," which I attempt to do in my own research. I want to counteract the tendency to depict governmental institutions as merely passive receptors and conduits of market penetration into local production. Where decentralization has occurred, it is also necessary to get beyond central government roles. I agree with Robbins (2003), as well as Moore (1993), that there needs to be greater sensitivity to heterogeneity within the state at multiple levels in contrast to its treatment as a monolithic entity.

MULTIPLE SCALES OF ANALYSIS

Political ecology examines the “constantly shifting dialectic between society and land-based resources” (Blaikie and Brookfield 1987: 17). Analysis often follows a multi-scale “chain of explanation” approach by defining site, symptom, practice, decision making, society, state, and world (Blaikie 1995b). Likewise, Peluso (1999: 41) suggests a cross-scale approach by first, identifying the user as well as the particular management strategies, institutions, and sources of conflict and cooperation; second, examining state and market systems or aspects of forest management that have been superimposed on local or customary systems; and third, defining national and international influences. Layers of competing claims may strain local capacities for forest management.

Political ecologists highlight the diversity of perspectives at different scales, although they are sometimes not direct enough in their use of scalar analysis, and among stakeholders in various sectors. There can be social fissures within each governance layer, as well as between them. Overlap among scales is common and actors shift their interests and develop alternative options at different organizational levels. Because of the importance of such cross-scale interaction defining the outcome of development, I think even greater attention to scale is necessary within much of the field of political ecology. Blaikie and Brookfield (1987: 14) concur with this opinion, as they stated: “The scale issue is crucial to the definition of land management because it focuses on the boundary problem of decision making and of allocating costs and benefits.”

Political ecology demonstrates the fundamental importance of ecological scale in defining spaces of political-ecological interaction and highlights “the relational and simultaneous nature of human-environmental scales” (Zimmerer and Bassett 2003: 4).

Scale mismatches occur when the spatial requirements of a species or ecosystem do not correspond with the administrative levels of management. International development projects increasingly incorporate scale into their models, yet I have observed that they often appear inflexible about scalar configurations. Funding is almost always channeled through national level institutions. Meanwhile, rigid ideas that “small is beautiful” or “large is effective” may not incorporate the particular social and ecological characteristics of a specific project. In contrast, Zimmerer suggests that it is necessary to recognize a multiplicity of landscape scales beyond the standard hierarchy of global-national-local. He criticizes the fact that conservation projects frequently overlook work at the extra-local scale, such as with several communities, such as multi-village blocs in eastern Nicaragua. Projects often either work with one village, or jump vastly in scale to have their programs coincide with particular political boundaries, such as districts or nations (Zimmerer 2000a).

Political ecologists have long suggested the need for a regional perspective, which is not a fixed notion, but rather one that shifts depending on the ecosystem under analysis. Blaikie and Brookfield (1987: 17) advocate for a regional political ecology stating, “The adjective ‘regional’ is important because it is necessary to account for environmental variability and the spatial variations in resilience and sensitivity of the land, as different demands are put on the land through time.” For Zimmerer and Young (1998), the region is an important unit for conservation analysis. The region is made up of multiple landscapes, which in turn contain a plurality of ecotone areas, such as forest patches. As an intermediary scale, regions allow for broader understanding of ecological conditions and habitat linkages without losing sight of the social and ecological

uniqueness of a zone. With greater focus on social theory, Peet and Watts (1996) discuss the use of “regional discursive formations” that display the effects of specific physical, political-economic, and institutional settings at regional levels. This type of regional analysis, I suggest, is especially relevant to an autonomous zone, such as eastern Nicaragua.

I strongly agree with Zimmerer (2000b) when he advocates for the incorporation of concepts of ecological flux into conservation scaling. Static ecological boundaries and fixed homogenous scales of political involvement are unlikely to produce successful conservation projects. Zimmerer suggests the use of overlapping patchworks with multiple dynamic boundaries. His emphasis on flux means that conservation units can be more flexible to incorporate temporal changes occurring in social, political, and ecological systems. Zimmerer (2000a) notes that one reason that community-based conservation projects often fail is because they are based on an assumption that customary institutions and land use areas are fixed and stable when, in fact, they have usually changed over time and continue to transform in terms of scale and territory.

Robbins (2004) utilizes the notions of diversity and flux to justify moving beyond the simplistically scaled ‘chains’ of explanation approach to analyzing networks. He notes that this involves an exploration of complex and shifting linkages formulated around accumulation, extraction, investment, growth, reproduction, exchange, cooperation, and coercion. Robbins believes that while networks are diverse, each one is probably not unique because of common patterns and processes. I would argue that each development network is likely to be unique, but I agree that there are commonalities that can and should be identified as a means to further socio-environmental analysis.

Political ecologies of globalization can be grounded in notions of livelihood, scale, place, and network (Bebbington and Batterbury 2001). All four concepts are directly relevant to this work, but networks have been the least explored to date in geography and political ecology. The examination of networks is a way to focus on the combination of processes that tie scales, and various opportunities at different scales, together. The analysis of rural livelihoods and landscapes must increasingly be joined with discussions of globalization as transnational linkages expand around the world. A variety of linked actors form networks to create new options, in terms of markets, trade, and development, or circulate ideas and knowledge. The details of specific examples can help to clarify and ground the idea of networks, which is a complex concept that may otherwise seem vague. Bebbington and Batterbury (2001) thus argue that it is helpful to study transnational networks ethnographically and comparatively, as I have done.

GLOBALIZATION AND ENVIRONMENTAL CHANGE DISCOURSES

The analysis of environmental and development discourses has become prominent in recent years (e.g., Litfin 1994; Hajer 1995; Dryzek 1997; Grillo and Stirrat 1997; Adger et al. 2001). Building on Michel Foucault's seminal work on discourse analysis, Peet and Watts (1996: 14) define discourse as "an area of language use expressing a particular standpoint related to a certain set of institutions. Concerned with a limited range of objects, a discourse emphasizes some concepts at the expense of others." Conceptual categories and labels carry with them the discursive power to shape material processes. A discourse may be hegemonic if it dominates thinking and translates into institutional formations (Hajer 1995). Grillo (1997) points out that there are multiple co-existing development discourses as there are a multiplicity of voices and "knowledges."

Not all discourses have the same global power. At times, it can be difficult to discern plural discourses because the vocabulary of the dominant discourse is used (Adger et al. 2001). Different discourses often become points on the same continuum as they redefine each other.

Building on the work of Piers Blaikie, three central development discourses can be identified in Table 3: paternalist (classic), (neo) populist, and neoliberal.

TABLE 3

Approaches to Environment-Society Relationships
(Blaikie 1994: 22; Blaikie and Jeanrenaud 1997: 61)

	Paradigms		
Variable	Paternalist	Populist	Neoliberal
peasant behavior	ignorant, irrational, traditional, corrupt	virtuous, rational, community-minded	rational, egocentric
immediate cause of problem	mismanagement by users	mismanagement by state, capitalists, transnational corporations	poor government policies and bureaucratic rules and regulations
structural cause of problem	overpopulation, backwardness, lack of foresight, ignorance	resource distribution, inappropriate technologies	inappropriate property rights, institutions, and prices, and rapid population growth
diagnosis	environmental solutions	socio-political solutions	economic solutions
institutional prescription	top-down centralized decision making	bottom-up participation	‘market’ policies, property rights, resource pricing

Dryzek (1997) identifies a similar three-fold development paradigm schematic: administrative rationalism, or ‘leave it to the experts;’ democratic pragmatism, or ‘leave

it to the people' and economic rationalism, or 'leave it to the markets.' In relation to the above table, Blaikie (1994) notes that the neoliberal approach often combines some elements of the other two paradigms. Institutions are seldom based purely on one school of thought, although one perspective usually dominates.

Modern development is a historically produced discourse with its own regimes of truth justifying the expansion of Western reason and principles (Escobar 1995). Many political ecologists, me included, criticize the dominant neoliberal discourse that promotes the sustainable development agenda because it proposes that a brighter future is available for all, but in reality it advances the economic and strategic interests of a few. Although an appealing concept, sustainable development does not acknowledge that ongoing economic growth and unregulated trade may threaten the livelihood of marginal populations, as well as the persistence and integrity of ecological systems (Blaikie 1994).

One of the core elements of development discourse, according to Peet and Watts (1996), and many others, is the premise that things can get better. Key development institutions, such as the World Bank, increase their own power by asserting that they have the ability to make things better. While globalization may appear to be politically neutral and offer a united purpose, Kelly (1997) suggests that, in fact, the discourse of globalization is often used to justify and enhance the power of those that are already economically and politically powerful.

Inequalities cross all scales from the global to the local. In developing countries, "The discourse of globalization is translated by local elites into political practices that significantly mediate how lived experiences relate to global flows" (Kelly 1997: 152). Mander (2003) discusses how resources are privatized, enclosed, and commodified as

part of the globalization project to bring even more raw material and territory into play for corporate access, investment, development, and trade. Concern over neoliberal economic reform and free trade largely stems from their tendency to increase inequity. Neoliberalism generally involves trade liberalization, privatization of industries and services, reduction of the public sector, and promotion of market-oriented management practices (Perreault and Martin 2004). Subsequent global marketing configurations frequently exclude local producers (Shiva 2003). Large, industrialized, nonresident producers control global markets. Although my experience in analyzing development has convinced me that Shiva's analysis is often valid, I am concerned that critics generally do not provide viable alternatives to neoliberal models.

In addition to defining alternatives, it is also to better communicate how political construction of environmental problems and the framing of scientific knowledge are used to advance certain development interests. Adger et al. (2001) suggest that the utilization of discourse analysis makes political ecology more sensitive to, and better able to depict, these processes. I would add that scalar analysis can also play a role. In developing countries, policy-making institutions are often distant from resource users, their proposed solutions might not match local-scale ecological and social dynamics, and they simplify local realities to fit with standardized ideas within global discourses.

Adger et al. (2001) argue that there are striking parallels in the nature and structure of global discourses on deforestation and biodiversity. Two dominant "counter" visions, the neoliberal paradigm and the populist paradigm, rely on fundamentally similar tactics. First, they utilize the ideas of environmental crisis and irreversible change, creating severe social, economic, and political ramifications to justify intervention.

Second, both discourses stress the identification of villains, heroes, and victims, although they do not agree who should be placed in each category. Third, both require the oversimplification of existing complexity to strengthen and solidify the development narratives that they rely upon. Narratives are stories, scenarios, or arguments common to a group of people. Roe (1999) describes how metanarratives are used to align multiple and opposing development narratives.²²

There is often considerable political maneuvering in the use of science to inform policy. Arguing for a well-grounded historical and regional setting, political ecologists describe how international finance institutions, transnational development agencies, and NGOs sometimes employ analysis that is fundamentally wrong in its ecological understanding, as well as insensitive to local knowledge and livelihood production (Zimmerer 1996; Brown 1998; Fairhead and Leach 1998; Sundberg 1998a, 1998b; Bassett and Koli Bi 2000). In six West African nations, Fairhead and Leach (1998) found serious misconceptions and inaccuracies in the dominant analyses of deforestation. They advocate for both practical and conceptual change in the way that resource management and global environmental governance is carried out. The first step is accurately determining the history of environmental change. Rather than condemning local practices, it is necessary to investigate how and why they have evolved. In doing so, the research-policy process and its power relations are reconceptualized. Fairhead and Leach show that the forestry statistics in international circulation are supported by power

²² Metanarratives simplify, underwrite, and stabilize the assumptions for decision making in development situations involving a high degree of complexity and uncertainty. Roe calls for discovering the missing details in metanarratives, de-narrativization, and creating counter-narratives in order to maintain heterogeneity in development analysis. Discourses and development paradigms cannot be seen as constant. As narratives and discourses continue to transform there is potential to counter and expand dominant arguments to improve development programs and their analysis.

relations with long historical roots. They conclude that it is going to take considerable effort for politically neutral ecological data, or even data that has been rigorously and critically analyzed by both local and international experts, to circulate widely.

In general, political ecologists and earth scientists share an appreciation of rigorous use of long-term or historical data. Yet, there is often distrust and lack of respect between natural and social scientists (Blaikie 1995a). Political ecology will have embarrassing results if it is based entirely on the analysis of social scientists. Earth sciences play a central role in the analysis and explanation of socio-ecological relationships and in the identification of environmental problems (Taylor and Buttel 1992). However, it is important to understand the ways in which natural science research is socially constructed and culturally embedded. A global scientific agenda exists in terms of what gets studied and what is ignored, the categories used in the process, the relationships investigated, and the ideological assumptions surrounding scientific terms such as sustainable, degradation, or biodiversity. Particular institutional and reward structures enveloping research may influence these factors.

SOCIAL JUSTICE

One of the strengths of political ecology is its attention to marginal social groups (e.g., Peluso 1992; Moore 1993, 1996; Escobar 1996; Brown 1998; Sundberg 1998a, 1998b, 2003a, 2003b; Bassett and Koli Bi 2000). In most socio-ecological interactions, there are differentials in power, information, and resource access. While inequality between scales is frequently recorded, it is also necessary to depict discrepancies of power within the same scale. In villages, local elite often gain disproportionately from development programs. Poorer segments of society tend to be more dependent on a

broad array of forest products (Peluso 1999). Trees in communal areas provide an accessible source of income for the poor because they do not require advance capital or skill to acquire (Arnold 1992). Trees are fairly inexpensive to harvest if traditional (e.g., hand saw, oxen, and aquatic transport) or low technology (e.g., chainsaw) practices are used. However, if forest products acquire a higher commercial value, local elite often try to monopolize the benefit. The poor may lose most and gain least from new resource regimes.

I think that the political ecology approach assists to capture complexity in landscape use and management within the local scale. Local resource development actors must evaluate the spatial patterns of labor, control, responsibility, expertise, and interest at the intra-household, inter-household, and community levels (Rocheleau 1995). Understanding multiple uses and meanings, such as “wild” and “commercial” species, involves identifying social differences due to gender, age, ethnicity, locality, and occupation. Not recognizing social heterogeneity and power inequalities is a central reason why community projects fail in developing countries.

The following paragraphs explore the issue of gender as one example of power inequality in development projects. My goal here is to point out how a political ecological framework assists in critical analysis of power relations. The example of gender is used, but the following discussion has broader applicability.

Feminist political ecology critiques power relations in resource management related to gender, but it also addresses social differences stemming from issues of class, race, ethnicity, occupation, ideology, age, locality, status (caste, leadership roles), religion, or other poles of identity (Rocheleau 1995; Rocheleau et al. 1996; Peluso 1999).

Feminist approaches offer important insights on domination. According to Warren (1990: 127-8), the three elements of an “oppressive conceptual framework” are value-hierarchical thinking (e.g., “up-down” thinking which places higher value, status, or prestige on what is “up” rather than on what is “down”), value dualisms (e.g., disjunctive pairs in which the disjuncts are seen as oppositional, exclusive, and one is valued more than the other), and the logic of domination (e.g., argumentation that justifies subordination). Each of these elements is prominent in development paradigms and influence how interventions are planned and implemented. Justifications for global intervention into local affairs frequently prioritize higher-scale decision making and value technical solutions above customary norms.

Actors at different scales in transnational resource development projects can have very different gender perspectives. International agencies often lack an understanding of local gender norms (Schroeder 1995, 1999). Based on my observations, transnational development projects often play an interesting role in gender relations because women’s rights standards in global conventions may be more advanced than local norms and, therefore, suggest that change is necessary. International donors’ gender-based incentives and quotas can create unintended conflicts in households and villages as female participation can be divisive. International interventions that are rushed may backfire and increase social conflict and resistance to change. I suggest that it is important to understand the cultural norms in the area to know what additional support needs to be provided to new women leaders. If not, women may become disempowered.

With racism, sexism, and other social inequalities, there are often local actors that are critical of discriminatory practices. I judge that outsiders sometimes miss

opportunities to partner with local advocates when their community linkages are weak and their knowledge of actors is limited. Ethnographical methods, which focus on long-term research, sensitivity to local differences, and providing a voice to community members, is an important element of much political ecological work and contribute substantially to culturally sensitive development projects. I consider that political ecology's attention to history and change over time also assists in understanding how social inequalities have developed and the purpose that they serve to local populations.

In my opinion, political ecology is an appropriate framework for research involving indigenous peoples because of its attention to social justice and the participation of marginalized populations in development. Yet, this approach needs to be applied with caution. Based on its roots in Marxism, political ecological analysis is often biased against private enterprise and privatization (e.g., Peet and Watts 1996). Indigenous populations do not need outside intellectuals to define what is best for them. Populations in this study have taken a pragmatic approach to commerce-oriented development, and some indigenous people enthusiastically embrace private enterprise in the hope to improve their well-being (Bebbington 1996). Nevertheless, political ecology is still an appropriate framework if utilized with sensitivity because of its recognition that there are multiple discourses and practices that are culturally, historically, and politically contingent, and analysis must come to terms with complexities and potential contradictions.

While presenting indigenous populations as static, non-capitalist, traditional, or subsistence-oriented is inaccurate, the uncritical acceptance of market solutions in indigenous communal areas may be equally problematic. I charge that culturally sensitive

solutions should leave open the realm of possibilities so that indigenous populations can decide on an appropriate path. My concern over market-oriented solutions intensified during this study because the neoliberal development paradigm appeared to create difficulties for actors involved to envision alternatives. It is one thing for indigenous peoples to survey a range of development possibilities and choose commerce of communal resources because they feel that it is the best option; it is another matter when this is the only path presented.

In my observation, commerce-oriented models are not merely suggested to local populations in developing countries. Advocates lure local support with million dollar project budgets and promises for employment, services, and infrastructure. By the time outsiders arrive to indigenous villages to rally support and consult with local representatives, projects have already been approved in distant headquarters, and if funding is based on a loan, the state would have signed financial agreements. International and national officials have pinpointed a specific agenda and defined a program to reach their objective. Yet, in my experience, after rapid consultations with local stakeholders, projects are deemed “participatory” (author’s fieldnotes). Likewise, I have observed that when representatives from sub-national institutions attend meetings, projects are then listed as ‘decentralized.’

I argue that the use of indigenous populations to achieve donor or state agendas deserves attention. A Miskitu elder acknowledged this process in 2002 when he stated, “Indigenous people are seen as tools. We are being used like a rope is used. Once they have lassoed the cow, they put the rope down.”²³ Another elder added, “They believe that

²³ Pers. comm., Spanish and Miskitu, 05/05/02.

the indigenous are innocent and ignorant and can be used for their means.” Chapin (2004) and Colchester (2003) specifically document these processes as they relate to international conservation agencies.

COMMODITIZATION OF NATURE

Political ecologists frequently address the capitalization of nature, commodification, privatization, and “market triumphalism” (e.g., Watts 1994; Escobar 1995, 1996; Peet and Watts 1996).

[T]he management of nature entails its capitalization, its treatment as a commodity. Moreover, the sustainable development discourse purports to reconcile two old enemies—economic growth and the preservation of the environment—without significant adjustments to the market system (Escobar 1996: 49).

Escobar (1996: 57) suggests that ethnic communities in tropical rainforests are recognized as the owners of their territories “only to the extent that they accept seeing and treating territory and themselves as reservoirs of capital.” This analysis is important, but it must be balanced with examples of human agency at multiple scales or it is overly structural in explaining natural resource use and management (Moore 1993) and biased toward larger scales. While some may argue that the economic and political structure constrains human agency, I suggest that it does not erase individual choice. As I discuss later, in Nicaragua, individuals and groups in households, villages, village blocs, municipalities, and regional and national structures act on their own free will, frequently without any knowledge of international laws and policies (author’s fieldnotes). Their choices have important implications for the success or failure of transnational projects, as well as for the replication or loss of their customary cultural practices. The most powerful corporate CEO, head of state, or bank executive cannot entirely control how Nicaraguans

think and act. Although international policies and programs may instigate change, development will depend in large part on ordinary Nicaraguans.

Zimmerer (2000b) comments extensively on new hybrid nature-society conservation geographies premised on privatized and commodified nature. Examples include biosphere reserves, conservation easements, co-management zones, and certified sustainable forests, along with the ten case studies in this work. These generally models focus on the stabilization of commodity production, expanding markets, and economic stability. Some emphasize the negative impacts of local populations on natural areas. I suggest that this is not merely done because they have ecological consequences, but rather because they may threaten the supply of resources designed for international markets or the pristine environments promoted in ecotourism.

“Nature has become an emporium, a commercial warehouse awaiting its brokers” (Zerner 2000: 4). Often the brokers are conservation groups who base their marketing activities on three interrelated justifications. First, by increasing the market value of previously uncommodified goods, resources are less likely to be destroyed thoughtlessly. Second, control over the sale of natural goods by parties interested in conservation is more likely to assure sustainable utilization, harvest of species that are abundant rather than scarce, and extraction in areas where priority biodiversity is not considered threatened. Lastly, proceeds from commodity sales can fund conservation.

The market has been positively valorized in many recent conservation and development projects involving debt swaps, ecotourism, ecomodification and export, certified lumber, and bioprospecting. Ecomarket hybrids build on the idea that nature contains many potentially useful services and products. Conservation groups, donors, and

state agencies broker natural resources based on a “conservation with use” philosophy. Proponents of market-based approaches argue that earlier conservation policies and methods did not work, while these strategies are efficient and more realistic. The neoliberal paradigm is presented as a “win-win” solution because conservationists and developers can supposedly both meet their goals, although I question the merit of this assumption in Nicaragua, where project results generally exhibit an “either or” tradeoff and conservation is usually the loser.

There are various reasons for the recent surge in market-based conservation approaches. First, in spite of ever increasing demands, there are limited public resources to combat environmental problems. Second, there is rising frustration at the inability of state-centered approaches to protect forests. Discouraged by an inability to advance an international forest convention, environmental groups have increasingly supported private sector approaches. Third, commerce-based programs complement state and nongovernmental approaches. They can take pressure off of the state as the primary management institution and enforcement authority. Lastly, market-based approaches help companies to obtain benefits and avoid costs. There was fear of potential boycotts of forest products after various environmental campaigns in the 1980s and 1990s targeted retailers. This encouraged corporations marketing conventional lumber from the tropics to search for alternatives. Ecolabels, demonstrating harvests from certifiably sustainable and well-managed sources, were attractive to companies because there were potential profits to be earned from selling certified products, while at the same time supplying these products silenced the criticism of previous opponents. In the end, market-based

approaches encouraged commitment to conservation in a sector that was previously disinterested, that of transnational corporations.

Economic instruments for environmental protection affect the costs and benefits of alternative actions (Elliott 2000). A basic objective of economic instruments is to appropriately define the pricing of natural resources to encourage their efficient use and allocation. There are dozens of types of economic incentives for biodiversity conservation. According to Elliott, these can be broken down into four main categories: positive incentives, disincentives, indirect incentives, and the removal of perverse incentives. For example, the higher value of organic produce when compared to conventional produce is a positive incentive. Disincentives include user fees or fines for ecological harm. Indirect incentives include mechanisms that create or improve on markets and price signals. Ecolabeling, including forest certification, is currently considered an indirect incentive because the provision of information assists consumers to make more informed purchasing decisions leading to the differentiation of products and markets (Elliott 2000). There are many potential benefits from the use of economic incentives and market mechanisms to motivate change in the forest sector (Pearse 1998). First, economic instruments, such as the appropriate pricing of resources, property rights, taxes, subsidies, and other types of incentives, are considered easier to implement and oversee than “command and control” governmental interventions that create restrictions, regulations, performance standards, and required technologies. Thus, incentives are less costly for governments to administer and enforce. Second, there is greater flexibility and free choice among a range of options to meet environmental goals, which many translate into lower costs for both producers and consumers. Third, market mechanisms aim to

reflect resource value in prices so they may encourage more efficient allocation and use of resources. Fourth, market mechanisms may respond more effectively, and with less uncertainty, to changing economic circumstances.

Advocates believe that price signals will provide incentives for markets to shift to promote sustainable management. However, it has not been easy to create a market for eco-labeled wood, even in the United States and Europe, where much of the pressure for certification of sustainable managed forests emerged. In addition, there are broad constraints for market mechanisms targeting tropical forest management. Only a small portion of the industrial roundwood harvested in tropical regions enters the export market, where price signals supporting eco-labeling are believed to originate. At this point in time, domestic consumer demand for certified woods within tropical countries is virtually non-existent.

One of the greatest challenges for forest certification is strengthening consumer demand. The Global Forest Trade Network (GFTN) was established to address this need. GFTN is an independent network of forest producers, manufacturers, intermediaries, and distributors who promote the marketing of certified products (WWF 2004b). GFTN is made up of more than five hundred companies, including some of the biggest lumber suppliers, forest owners, furniture makers, architects, construction companies, retailers, and investors. Started by WWF, GFTN has become a powerful international alliance. There are twenty-two regional forest trade networks now in existence around the globe. Jagwood+, the Central American member of the GFTN, was created in 2001. Eco-marketing alliances such as Jagwood+ are considered mainstream today. In prior decades,

they might not even have been considered. Lumber certification has advanced a broad application of market-oriented conservation (Gulbrandsen 2004).

A key point of this work is that markets can never be fully separated from the state, even in the midst of free trade, as government policy provides an institutional setting for financial transactions. State procurement policies and other economic actions influence commodity sales (Cashore et al. 2004). Governments can grant resources to groups or provide other economic incentives, such as subsidies or tax breaks, to promote environmentally friendly behavior. States govern property rights, which is an important element in any natural resource regime. The state is also involved in standard setting for forest management indicators and negotiates international environmental and economic accords. According to Watts (1994: 375; italics in original):

[M]arkets are neither free (they are expensive) nor to be conjured up naturally (they have to be built and constructed)...The invisible hand often requires a visible fist. Reformism has been overly concerned with a narrow (ideological) definition of market *principle* rather than with market *practice*.

Market-based approaches have their critics. It has been difficult to broker global biodiversity marketing. Critics argue that a small fraction of the benefits derived from the commercialization of biological resources stays in the source country (Ghimire and Pimbert 1997). Moreover, prices do not sufficiently integrate externalities. If externalities are not included and commerce is based on short-term profit rather than long term sustainability, market approaches may not protect local resource rights or ecological processes. In developing countries, there are many reasons, including rent-seeking, that market-efficient behavior may not occur (Blaikie and Jeanrenaud 1997). It is not right to assume that free markets will lead to equitable natural resource management or use (Zerner 2000).

Governing forests through markets creates some important concerns. First, policy often considers market values of being of greater importance than non-market ones (Brown 1998). In a globalized economy, the emphasis remains on wood production at lowest per unit cost in order to compete with other source areas. Subsistence production, community institutions, cultural rights, and other important factors may be ignored. In general, unsustainable practices of “liquidation logging,” with immediate harvest and no future investment, generate the greatest financial returns. Cost-benefit analysis is often primarily concerned with the present, while forest management requires a longer time horizon. There are limitations of an allocation-based approach to sustainable forestry management because splitting forests into parcels for conservation and production may reduce habitat connectivity or inadequately address biodiversity requirements at different scales (Lindenmayer and Franklin 2002).

A market-based approach is not guaranteed to promote conservation activities. Added income from the sale of commodities may in fact be used to support ecologically degrading activities. Resource markets in developing countries have both formal and informal components (Peluso 1999). State policies may not take informal markets into account, although they often make up a large portion of commerce. Fourth, market mechanisms may not insure the interests of some stakeholders. Not all sectors of society gain equally from the sale of natural resources. Sometimes the people with the most to lose from sale of a resource get the least benefit. Markets can only be expected to operate efficiently if producers have control over their inputs (Pearse 1998). In areas with insecure tenure or ineffective communal governance, this control may be lacking. Markets are prone to deliver unsustainable outcomes when consumers lack the

information necessary to make informed decisions. Information on environmental markets currently remains poor (Tollefson 1998). Most consumers do not know the consequences of their forest product purchases and so they are not motivated to change their preference for conventionally harvested materials.

Different types of goods and services from the forest are measured differently. Converting natural capital to manufactured capital adds one type of value, but implies the loss of another (Prugh et al. 2000). A tree's contribution in terms of ecological services within a forest ecosystem is just now beginning to be evaluated in carbon markets. However, the loss of habitat, evapotranspiration, and water regulation are not evident in a nation's Gross Domestic Product, or most other economic measures, when a tree is harvested. In contrast, the value added from turning the tree into lumber is included, which allows for inconsistencies in the current valuation of a forest's goods and services. Although "multiple use" forest management is often advocated, there are different incentives to harvest or protect different resources, leading to a possible distortion in the combination of uses (Pearse 1998).

The forest policy of developing countries often supports wasteful practices that make poor economic sense (Ascher 1999). For example, when logging concessions are granted, they are often granted for less time than felling cycles, meaning that there is little incentive for a company to reforest (Walker 1987). In addition, governmental taxes are often based only on the marketable timber that is removed from the concession instead of on that which exists in the stand. Thus, companies use wasteful methods, which often destroy parts of the remaining forest, yet they never pay for the damage.

Examining the role of markets generally requires a complex, scale sensitive, place-based framework. Zerner (2000: 4) states:

[T]here is no single market operating at a fixed scale and associated with particular social and environmental consequences. There are, rather, multiple, culturally shaped forms of markets that are inserted into, and articulated with, divergent economic, historical, and environmental contexts. There is no entity, 'the market,' that exists outside of history, culture, and geographical context.

Markets, as described in resource economics, are generally treated as abstract meeting places of producers and consumers stripped of history, social context, and biophysical reality. Place is reduced to transportation costs and time focuses on the immediate present (Gowdy and O'Hara 1995). Yet, Peluso's (1994) study of teak in Java demonstrates the intricacies in how markets articulate with village production and the environment. Demonstrating the importance of the historical moment in defining market impacts, Peluso's work documents the interrelation between political power and markets at multiple scales from the local to the international.

In my analysis, economic policies often need to be formulated with greater temporal, spatial, and cultural sensitivity. For example, Brandon (2001) highlights difficulties with the standardized use of economic incentives to drive conservation. First, few enticements will work for all stakeholders. Different individuals respond to distinct motivations, as do actors at various scales. Not all community members are willing to exchange immediate harvest rights for alternative income sources, no matter how potentially lucrative. Some options may attract different age groups, genders, or social classes and conflict over alternatives may arise. Second, there may be political, ethical, religious, or cultural practices that could override economic incentives. Third, what is defined as an effective or appropriate incentive is likely to change over time. Lastly, it is

difficult to link economic incentives to desired conservation outcomes. The use of incentives is complex and I have witnessed that some strategies do not achieve their goals.

There is a range of opinions regarding commerce-oriented conservation. Some organizations wholeheartedly use the power of the market to advance their agenda. A children's game on the World Wildlife Fund's (2004) website, called "Shop 'N' Save: Be a smart shopper and save our forests," demonstrates this type of campaign.²⁴ The game challenges the player to buy responsibly and advocates the purchase of certified lumber. There is no parallel discussion on how refraining from buying forest products could also help save forests.

Although they are not active in Nicaragua, there are many northern radical environmental groups, such as EarthFirst!, who reject all capitalist controls over conservation.²⁵ They criticize the fact that the linkages between economic growth in industrial countries and poverty in developing countries are seldom addressed by the international finance institutions or mainstream conservation organizations. Likewise, root causes of poverty, such as inequitable resource distribution, are not sufficiently addressed within current commerce-oriented conservation models. These environmentalists charge that instead of focusing on selling goods and services as a

²⁴ Available at <http://www.panda.org/games/fsc/#> on 12/09/04.

²⁵ Within international NGOs polarization exists over market-based conservation. Some NGOs could be categorized as system-reforming: these tend to accept larger economic structures and lobby for the improvement of forestry practices through mainstream, scientific approaches (Gale 1998). System-transforming NGOs seek change in larger political economic structures. This split is further complicated by separation between NGOs based in the north and south. There are both system-reforming and system-transforming groups in the south, but some groups in developing countries are concerned about closing off potential development options with strict environmental legislation or systemic reforms. Southern NGOs often struggle against northern domination. Many southern NGOs push to have environmental issues broadened to include social justice for workers, land owners, and ethnic groups.

means to conservation, activists should organize campaigns targeted at citizens of industrial countries to buy and consume less.

Criticisms of the impact of trade on developing countries and tropical environments abound. Daly (1992) and Perkins (1998) provide extensive overviews of the potentially negative consequences of trade for local people and ecosystems. There are specific concerns for indigenous populations, who may or may not have experience with global resource markets, and especially for groups sharing property communally (Richards 1999). Communal forests tend to be of lower value, at least in terms of lumber production, in comparison to private holdings. Forestry projects with high economic risks and discount rates, combined with informal or weak common-pool institutions, are likely to have high transaction costs.

Commodity marketing can change the use of the forest. With directional felling practices in tropical environments, there is a hierarchical range of values placed on different species of trees at various stages of development that lie around the tree targeted for harvest. Felling a tree in the direction of less desirable trees causes the minimum loss of profit if damage occurs. In another example, when there is competition for space, light, or nutrients, foresters may girdle or poison less valuable species to assure the health of those that are more valuable on the world market. Although natural regeneration is often utilized in tropical lowland forests, valuable species are often given assistance to beat out their competition in a managed forest. The goal to increase the percentage of commercially valuable species within a concession may run contradictory to the maintenance of species heterogeneity and forest biodiversity. Likewise, in carbon

sequestration projects, market pressures may exacerbate scientific and bureaucratic pressure to simplify forests and rigidly control inputs and outputs.

Fogel (2004) argues that carbon sequestration markets reduce the role of local stakeholders and distort the use of forest resources. Large plantations and global research agencies are advantaged above smaller community-based enterprises because their carbon production potential is easier to see and control. They are perceived as being more efficient because they have fewer objectives, whereas community forestry projects have many interrelated goals. Global institutions are less accessible to most small-scale efforts. Financing is often given to larger enterprises that are better linked to government, NGO, and donor networks.

In the midst of the Kyoto Protocol's discourse on market efficiency in carbon forestry, Fogel (2004) believes that local communities and indigenous populations are virtually ignored.²⁶ She states (2004: 111):

Global economic discourses thus consign local actors and the complexities of their worlds to obscurity or at best to crude mitigations recommended as part of socio-cultural impact assessments. In order to economically benefit from global institutions, the 'local' must accept its construction as compliant, homogeneous and safe, which is to say, absent.

I propose that the commerce of products from communal areas involves particular aspects that differ from sales originating from private or state land. Tenure is more often insecure in communal areas. There may be a multiplicity of formal and informal claims, which are difficult for outside groups to recognize and understand. The power to enforce

²⁶ Arguments emphasizing the reduction of transaction costs mean that the time and money spent on local involvement in planning and implementation will be reduced. Fogel also discusses how international climate change policies have failed to address social problems. For example, some carbon plantations as envisioned would require the relocation of local populations. In some existing projects, local workers had been paid less than minimum wage.

claims may also be spread across various institutions (Peluso 1999). Outside marketing schemes may restrict local use, benefit some actors at the expense of others, and create or increase conflict over communal land and resources. If formal tenure is lacking, natural resource planning and use is especially tenuous and multifarious.

The erosion of customary rights has long been discussed by political ecologists, but I would like to see the common property receive even more attention in the field and in geography overall. The commons have been treated more extensively in political science, anthropology, natural resource management, and other disciplines. Common property theorists have employed a broad range of statistical, comparative, and case study methods to analyze multi-scale resource institutions (Agrawal 2001a). The literature on common-pool institutions is extensive (Ostrom 1990; Hanna et al. 1996; Burger et al. 2001; National Research Council 2002; Dolsak and Ostrom 2003, among many others), as are the contributions relating specifically to communal forests (for example, McKean and Ostrom 1995; Richards 1997; Alcorn and Toledo 1998; Gibson, McKean, et al. 2000; Agrawal 2001b; Geores 2003). The general consensus is that property rights matter and that there are many property regimes, in addition to “non-property,” or open access lands.

Hardin (1968) believed that each producer in a communal area would rationalize his or her increased use of shared resources without sufficient consideration of the aggregate results. This would lead to ecosystem degradation and a tragedy of the commons. Common-pool theorists strongly criticize Hardin for not differentiating between open access resource regimes, in which there are no local “rules-in-use” to guide practices (Ostrom 1990), and areas under common-pool resource management with local

and multi-scale institutions that read ecological feedback and establish norms to protect production and the environment.

There are many perspectives on what is important for equitable, long-term, common-pool resource management. Common-pool theorists are self-critical over tendencies to downplay differences in order to identify and systemize similarities leading to success or failure in management (Mosse 1997; Cleaver 2000; Klooster 2000; McCay 2000). McCay and Jentoft (1998) call for greater acknowledgement of local diversity and processes of transition instead of stability.

There are both ‘thin’ and ‘thick’ perspectives on institutions. In the former, institutions are the system of rules and decision making procedures in formal or legal documents. In the latter, institutions include social practices and common discourses. For common property theorists, institutions are defined broadly and are made up of norms and entities that assign rights and duties and mandate how social groups use the natural environment (Berkes and Folke 1998). Resource institutions are understood as the property rights and “rules-in-use” that guide the governance of different species and areas (Ostrom 1990). These rules are independent from, and may contrast with, formal rules on paper, such as the provisions of contracts, constitutions, treaties, or other constitutive documents (Ostrom 1990; Young 2002a).

Communities with common property often recognize an interconnected bundle of various formal and informal rights to different areas and species in the same forest. Institutions range widely in terms of functional scope, degree of formalization, spatial domain, stage of development, and interplay with other institutions (Young 2002a). Common-pool resource management institutions are not a panacea and they will not work

in all situations. The conclusion cannot be drawn that wherever communal forests are in the control of local communities that successful management will occur. For example, Gibson's (2001) research in Guatemala examines two communities in neighboring districts with similar legal protection; one is able to successfully manage communal forests, while the other is not. Communal institutions require active stewardship: forest users generally must live in the community to be permitted to use communal resources, and they must participate in shared work. This high degree of cooperation usually functions best within a small population that has a shared culture. Indeed, Singleton and Taylor (1992) suggest that heterogeneity (e.g., in productivity, income level, race, or culture) disrupts communal management.

Ten universal requirements for robust local common-pool institutions have been identified (Ostrom 1990; McKean and Ostrom 1995).²⁷ Of these ten requirements, only one directly addresses scale – institutions for managing very large systems need to be layered, with considerable authority devolved to small components. While initially focused on the analysis of small-scale institutions, some common-pool theorists have moved their analysis up in scale. “[T]he romantic view that anything local is better than anything organized at a national or global scale is not a useful foundation for a long-term effort to sustain biodiversity,” states Ostrom (1995: 41). Effective common-pool

²⁷ User groups need the right to organize their activities, or at least the guarantee of no interference. The boundary of the resource must be clear. The criteria for membership in the group of eligible users must be clear; users must have the right to modify their use rules over time. Use rules must correspond to what the system can tolerate and should be environmentally conservative to allow a margin for error. Use rules need to be clear and easily enforceable; infractions of use rules must be monitored and punished. Distribution of decision making rights and use rights to co-owners of the commons must be viewed as fair. Inexpensive and rapid methods of resolving minor conflicts need to be devised.

institutions may need to be simultaneously both small and large-scale and also maintain flexibility between scales.

Since many biological processes occur at small, medium, and large scales, governance arrangements...also need to be organized at multiple scales and linked effectively together. The importance of nested institutional arrangements with quasi-autonomous units operating at very small up through very large scales is stressed (Ostrom 1995: 33).

Large systems require that governance activities, such as provision, monitoring, enforcement, and conflict resolution, be organized in multiple layers of nested enterprises (Ostrom 1990, 1995). Ostrom suggests that institutions should remain quasi-autonomous in a federal, rather than hierarchical, system. The dynamism and adaptation of nested structures is lost if vertical control dominates (Holling and Sanderson 1996).

I recommend that instead of looking for one “correct” management scale, it is helpful to determine how different scales can be managed simultaneously. The persistence of environmental degradation may be related in part to inattention to cross-scale linkages (Berkes 2002). The fundamental “problem of fit” is that an institution that may deal well with one situation may entirely fail in another context or at a different scale (Young 2002a). For example, financial incentives created to assist adaptation of the Kyoto Protocol may assist large-scale forest plantation owners in Costa Rica, but across the border in Nicaragua communal landowners protecting natural forests may see no benefit. It is often also incorrectly assumed that what works well in one area will also work in others. Public-private-communal co-management may work well in some areas where local institutions are strong and self-governing, but in another area where local organizations are weak or dependent, the results can be entirely different.

Coordination can make each smaller institution more viable and forward the collective claims of members (Annis 1988; Uvin et al. 2000). Yet, institutional nesting remains a vague concept, even though demonstrative examples have been presented. The Rural Federation of Zambrana-Chacuey, a forest cooperative in the Dominican Republic, has roughly eight hundred members (Rocheleau and Ross 1995). The members are organized into sixty farmers', women's, and youth associations in thirty communities. Management is carried out at the landscape or regional level through overlapping federation groups. An historical example of nesting occurred in Japan in the 1700s (McKean 1996). Proximate villages worked in conjunction to manage agricultural and grazing lands. Rights were granted within horizontal networks when villages shared costs and benefits equally. When costs and benefits were different among member villages, senior and junior co-ownership rights were determined. Senior partners had closer access as well as more responsibilities.

Horizontal linkages occur across space, but at the same level of organization (Berkes 2002; Young 2002a, 2002b). There are many political and ecological benefits from horizontal linkages. First, contiguous villages can cooperate and effectively impede undocumented extraction of natural resources by outsiders (McKean 1996). Second, forestry initiatives linked horizontally across space may also internalize costs that would normally remain external to smaller communal units or individual private property lots (Gibson, McKean et al. 2000). For example, a producer is likely to be more concerned about negative downstream consequences (e.g., erosion, pollution) if networked with downstream producers. Third, some natural resource systems can be more productive when intact instead of fragmented (McKean 1996). Fourth, multi-village blocks assist

small villages to obtain leverage when working with powerful state and private enterprises (Agrawal and Gibson 1999). Multi-scaled networks may also be useful in addressing challenges from political and economic elites in any particular group or level.

Vertical linkages connect institutions at different spatial scales (e.g., local, regional, national) (Berkes 2002; Young 2002a, 2002b). Vertical networks can provide important resources to local groups, but there are risks. Vertical interplay is often asymmetrical or unidirectional (Young 2002b). When scaling up vertically, networks need to maintain mechanisms of accountability to local populations and to resist the centralization of control over resources and decision making (Agrawal and Gibson 1999). Higher level institutions may question the capability of lower-level groups to solve problems. Local groups are sometimes expected to follow higher level mandates regardless of results. With both vertical and horizontal linkages, having a large number of participants at multiple scales or in different areas may also make organizational processes more time-consuming and costly (Ostrom et al. 1999), especially if there is duplication of work. It is necessary to find a balance between institutions at different scales in order to reduce transaction costs.

INSTITUTIONAL AND ECOLOGICAL FIT

The identification of scale mismatches has recently been integrated into a limited number of studies and is mentioned broadly in additional sources as requiring attention. Cash and Moser (2000) and Zimmerer and Bassett (2003) speak of scale discordance when the scales of biogeophysical systems are mismatched with the scales of management. Likewise, Brown and Rosendo (2000), Burger et al. (2001), Young (2002a,

2002b), and Berkes (2002) speak of the lack of fit or congruence between institutions and among institutions and the ecological zones they govern.²⁸

I have identified at least four types of institutional-ecological scale discordance in multi-scaled resource management projects: horizontal scale disjuncture, vertical scale disjuncture, spatial disjuncture, and temporal disjuncture. In my understanding, the first two types occur between institutions: horizontal scale disjuncture is predominately due to competition between groups at the same scale, and vertical scale disjuncture is predominately due to power differentials between scales. The second two types of disjuncture occur between ecosystems and institutions. Spatial disjuncture occurs when areal coverage of institutions does not match ecosystem boundaries or the spatial distribution of ecological processes. Temporal disjunctures involve time scale differences between institutions and the resources they are managing.

There are advantages and disadvantages to both small and large-scale organizations. Small groups are more likely to maintain cohesion and reduce administrative costs (Bruce 1999). Olson (1998) notes that social incentives for cooperation are more effective with face-to-face contact. Where members have first-hand knowledge of other forest users, participants feel a greater moral responsibility to

²⁸ Young (2002a) summarizes three groups of ecosystem properties that are especially relevant to problems of institutional-ecological fit: structural attributes, such as complexity, homogeneity, and interdependence, processes, such as productivity, growth, stabilization, and change, and linkages, including boundary conditions and transboundary interactions. Ecological-institutional mismatches also stem from imperfect knowledge, institutional constraints, such as budgetary limitations, and rent-seeking behavior, or actions to promote personal interest and individual benefit. There may be overlap between these sources, such as the combination of imperfect knowledge and rent-seeking behavior. In the interplay between international and national institutions, Young defines competence, capability, and capacity as important traits. These attributes appear relevant to multi-level institutions at all scales. Competence refers to the political and legal authority to uphold and implement commitments that have been made. Compatibility involves the fit or congruency between institutional arrangements and the social practices of the individual member groups. Capacity is a measure of the social and material resources necessary to meet promises.

contribute and are less likely to cheat the system. Ostrom (1987) advocates small common-pool resource management units because members can directly observe the positive impact of their management strategies. Degradation from mismanagement or error is more likely to be noticed. Small groups are also preferable because forests do not yield high outputs and often cannot support large populations. Yet, if institutions are too decentralized, feedback picked up by one group may not be communicated to others. Large-scale organization can sometimes coordinate activities in discrete locations more effectively and have greater access to human, financial, and technical resources, as well as media. However, in general, feedback loops at higher scales are looser, creating less motivation to act (Berkes 2002). Uniform large-scale systems have the potential to fail in ecological niches of high risk if they are not sensitive to local variations (Ostrom 1995). Large scale systems are often not sufficiently tuned to social differences as well. Given these advantages and disadvantages, the need for coordination between scales is evident.

Problems of fit between different institutions often occurs (Brown and Rosendo 2000). Tension may develop from contradictory goals and different interpretations of spatial or time scales. Different organizational options are accompanied by variable transaction costs. There can be conflicts over which institutional scale is responsible for covering these costs. While it is possible to theorize how costs and responsibilities could be split among different scales ranging from the local to the global, distribution can be difficult to operationalize (Dolsak and Ostrom 2003). Geores (2003) believes that it is helpful to define two kinds of resources in order to negotiate cooperation on forest issues among groups at multiple scales. Based on Giddens (1984), Geores differentiates between allocative resources, including material objects such as trees, and authoritative

resources, involving who controls access to the forest and who has the power to define appropriate use of it. Allocative and authoritative aspects of the same forest are often controlled by different groups or scales.

Key similarities between ecological and social scales of organization include the recognition of horizontal and vertical processes, interconnections and functional interdependence, inability to define specific boundaries, and fluidity and flux. The vertical approach integrates processes in the water table, soil, biota, and air (Barnes et al. 1998). Instead of separating the processes at each layer into distinct fields, such as hydrology, geology, biology, and meteorology, forest ecology examines the functional interrelationships in a given place at multiple scales. The horizontal approach in ecology examines the spatial differentiation of the Earth's surface and therefore helps to assess the diversity of the landscape. The effects of transfers between proximate ecosystems depend on the size, shape, and composition of the system; for example, the relative importance of horizontal transfer is less important in large systems. However, Aber and Melillo (1991) point out that all ecosystems are linked by their inputs and outputs.

Ecological terms sometimes lack specific scales or boundaries. Ecologists employ terms such as plot, patch, stand, basin, watershed, ecotone, landscape, biome, and ecoregion. Like scale terminology in human geography, such as community or region, these scales mean distinct things to different people and the relationship between the scales can change depending on the context. In terrestrial zones, two scale definitions are most commonly used: watershed and stand (Aber and Melillo 1991). Although watersheds can range from a few to hundreds of thousands of hectares, they are topographically defined areas because all the precipitation falling into the area eventually

leaves in a single stream.²⁹ The watershed concept has proven useful because of the widespread importance of water balance in ecology. Meanwhile, a stand can be defined as an area of sufficient homogeneity in regard to vegetation, soils, topography, microclimate, and past disturbance history (Aber and Melillo 1991). This can be a problematic definition because natural systems often vary over small areas and the idea of “sufficient homogeneity” is vague.

The scale of observation influences how social patterns and ecological processes are detected. In both natural and social sciences, processes that occur at one scale do not automatically register at other scales. The same way that the world looks different when analyzed from household, national, and global scales, processes are quite different at the level of the cell, tree, and forest. Phenomena that appear dispersed at one scale might appear concentrated if viewed from another (Herod and Wright 2002). Patterns appearing ordered at one scale may appear random at another (Meentemeyer 1989). Therefore, researchers who blindly employ variables occurring at one level to explain phenomena at another scale may fall victim to causation fallacies (Gibson, Ostrom et al. 2000). Individualistic fallacy results from imputing macro-scale, aggregate relationships from micro level, individual relationships (Meentemeyer 1989). Cross-level fallacies result from making inferences from one subpopulation to another at the same scale of analysis without sufficient attention to conditions and processes. Ecological fallacies result from applying inferences from higher levels to the micro-scale.

There is often a lack of congruence in time and space between institutions and ecological areas. The spatial scale of a forest stand may not match the spatial scale of

²⁹ Groundwater systems, such as in karst environments, are an exception.

government and management jurisdictions (Burger et al. 2001). I have seen that ignoring functional requirements ecological areas can be arbitrarily defined to fit with political jurisdictions, management areas, or research plots.

In natural resource management in developing countries, I have observed that agencies are often fragmented with various levels and units of government. If cross-sectoral cooperation is lacking, artificial separation between the different goods and services provided by the same ecological zone is created. Seldom does an agency have a system-wide perspective or political jurisdiction (Hobbs 1998). Moreover, cooperation and communication between different parts of the government is often poor. I feel that more research is necessary to determine the basic ways to match the spatial scales of ecosystems with coherent governance structures.

Temporal scales of ecosystems are often poorly matched with governance structures as well. The time frame for management is frequently too short in comparison with ecosystem processes (Hobbs 1998). ‘Management myopia’ describes policies that force long-term natural processes into short human temporal scales (Holling and Sanderson 1996). I have documented in Nicaragua that the natural resource agencies are frequently restructured and politicians are replaced after short terms (author’s fieldnotes). Different leaders and administrations cause policy changes at frequent intervals, which may not allow for clear linkages between state rules and forest conditions and can undermine long-term institutional development or coherency. Politicians and policy analysts may also look to match resource extraction to business or electoral cycles, investment calendars, or the human attention span directed at particular issues through media coverage. Many international donors commit to only five-year blocks, which is

insufficient time to build resilient common-pool resource regimes (Morrow and Hull 1996). It is also difficult to show sustainable forest management results in this short period. Short project cycles contradict the long-term commitment necessary for forest management.

There are many examples of how the factor of time as standardized within current transnational development policy plays a role as a disincentive to environmental protection. For example, environmental impact assessments were originally resisted because their duration works against donors' desire to accelerate preparatory phases of projects, especially when ecological constraints for original project plans were identified (Le Prestre 1995). In addition, while developing countries are open to accepting grants to support environmental programs, they are less interested in accepting loans that will need to be paid back in order to finance projects such as forestry, which will not provide returns for long-term.

By looking for constant yields, such as annual timber production, humans manage natural resource systems as if change was continuous and predictable (Holling and Sanderson 1996). Disturbance ecologists reject closed systems and stable states and suggest that environmental change is more complex than imagined in previous decades, as is institutional change. I suggest that resource management policy in the tropics often needs to give greater attention to the multiscalar and multitemporal nature of human-environment interactions. To adequately safeguard biodiversity, approaches at multiple scales, as well as linkages across the larger institutional and physical landscape, are likely necessary.

Lindenmayer and Franklin (2002) propose a multi-scaled approach to biodiversity conservation and forest management because ecological processes at different spatial scales are interdependent. Forests have multiple roles and how these are perceived often depends on the scale of use. For example, the role of one forest patch included in a logging concession may be very different than the protected area located next to it, or the nearby communal forest where village members hunt and gather. The coexistence of these forest stands, each with particular goals, must be included in an integrated management plan for the entire region. A single conservation strategy at a single scale will not meet all management goals or provide suitable habitat for a wide range of species. An organism-centered approach to conservation makes defining scale difficult because each species perceives the environment at different scales. Different species may have unique responses to the same landscape and often have distinct spatial needs.

Forest ecology is highly complex and many aspects have not been studied or are not broadly understood, especially in tropical moist forests. Nevertheless, overall recommendations have been developed to assist the formulation of specific management policies. As general guidelines, Lindenmayer and Franklin (2002) support the maintenance of stand structural complexity, connectivity, landscape heterogeneity, and aquatic ecosystem integrity. Structural complexity consists of compositional factors, such as a diversity of species, tree densities, and age classes, as well as the vertical structure, or layers of vegetation including the understory and canopy (Barnes et al. 1998). Connectivity involves the linkages of habitats, communities, and processes at multiple spatial and temporal scales (Noss 1991). Connectivity has an impact on the persistence and abundance of different plant and animal populations, but individual species will have

different preferences for spatial landscape patterns (Spies and Turner 1999). Landscape heterogeneity refers to the composition, diversity, size, and spatial arrangement of different ecosystems and habitats. If connected forest patches are left in different growth stages, this will support a wide range of biodiversity (Schelhas and Greenberg 1996; Spies and Turner 1999). Aquatic ecosystem integrity requires attention to aquatic biodiversity, water quality, and water quantity (Lindenmayer and Franklin 2002). Forest health and hydrological processes at multiple scales, such as precipitation, evapotranspiration, and infiltration, are tightly interrelated. Each principle or process ranges across various spatial and temporal scales.

In some cases, I propose that common-pool resource management may contribute to connectivity because of the ability to reduce fragmentation in shared management of larger areas as compared to small individual plots. If managed as a whole, communal forest tracts could potentially be harvested in patterns to increase or maintain connectivity. For example, logging may cause less fragmentation if it is contained to one section of a large communal woodlot instead of being carried out in multiple discrete sections simultaneously. Forest patch size and shape determines edge effects, which are biological and physical modifications created along boundaries between harvested and standing forests (Lindenmayer and Franklin 2002). The intensity and area of edge effects ranges widely and depends on many variables. In some cases, edge effects degrade habitat or disrupt connectivity. Edges appear to support different types and densities of vegetation than interior forests because of changes in microclimate, such as water, wind, and light availability. If these changes were perceived as undesirable, I infer that communal areas could be managed to reduce edges.

Conventional logging techniques generally do not follow Lindenmayer and Franklin's guiding principles. Practices to ensure cost efficiency or the greatest market value of commercial species would not necessarily prioritize the maintenance of connectivity or the reduction of edge effects. Economic factors have always played a formative role in the utilization of forests and, in many cases, may dominate policy decisions. A fifth guiding principle, according to Lindenmayer and Franklin, is risk-spreading with the application of multiple strategies at different spatial scales. Risk-spreading techniques contrast with the norms of production forestry.

Production forestry tries to reduce variability at the stand and landscape levels. Risk spreading, conversely, aims to ensure a range of conditions at all spatial scales; stands and landscapes are not homogenized (Lindenmayer and Franklin 2002: 41).

Major shifts in resource management have occurred, but policy has not always kept pace. According to McCay (2000), the dominant approach guiding modern conservation and forest management in the past had the following features: it was organized around utilitarian values stressing the greatest good for the greatest number; there was an emphasis on marketable commodities, and even when recreation or subsistence values were discussed, they were measured in market terms; science and policy relied on single-species data and models; there was a hierarchical approach to natural resource management with the utilization of top-down governance; decisions were generally based on scientific data or thinking; deterministic scientific models were expected to find predictable relationships among variables; and there were insufficient attention to people, except as constraints and demands on the system. Many of these traditions are still practiced in forest management in developing countries, as I have observed in Nicaragua (author's fieldnotes).

Gale (1998) and McCay (2000) highlight tenets of a more recent paradigm called ecosystem management. Gale (1998) summarizes the principles of the ecosystem approach as holism, complexity, uncertainty, scale-dependence, diversity, and long-term planning. McCay (2000) notes the broadening of forest valuation, collaborative planning, and recognition of non-deterministic science. Some aspects of this approach have been more widely adapted. For example, utilitarian values are seen as existing alongside less human-centered values, such as biodiversity. Bottom-up collaborative approaches are popularly promoted. Other aspects of ecosystem management have not been as widely accepted. These include the tendency to look at ecosystems as non-deterministic or unpredictable and, therefore, admit scientific uncertainty. This is often partnered with an increase in acceptance of the importance of local and indigenous knowledges.

Forest scientists have increasingly moved towards the use of adaptive management, which involves trial and error learning (Berkes et al. 2000). Adaptive policies assume that nature cannot be controlled and yields cannot be definitively predicted, even in managed ecosystems. The goal is to learn from feedback to implement practices that continue or reestablish resilience, which is the ability of the ecosystem to recover after natural and human disturbances, such as hurricanes, fires, or logging. Adaptive management requires ongoing monitoring and data collection so that policies can be adjusted in an iterative fashion. Most forestry projects in developing countries do not currently have the resources to maintain this level of oversight at local and regional scales.

Figure 1 summarizes recent shifts in natural resource management that increase complexity in four different realms. While policies in developing countries are beginning

to include some of these shifts, there is substantial lag time. There has been greater adoption into forest policy in developed countries.

FIGURE 1

Trends in Natural Resource Policy and Management
(Shelhas 2003: 23)

- Simple to multiple interests
 - Mixes of products, rather than simple commodities
 - Non-commodity values
 - Broader scales and cross-scale relationships
- Simple ownership to bundles of rights
 - Cross-boundary claims on private lands
 - Intermixed public-private domains
 - Legitimacy of communal ownership
- Deterministic science to multiple knowledge systems
 - Unpredictability, surprise, chaos
 - Interdisciplinary science and management
 - Traditional knowledge
- Public interest to stakeholder groups
 - Power as influencing ‘public interest’
 - Stakeholder groups
 - Panarchies³⁰ replace hierarchies

To date, there are approximately forty international and multilateral institutions that deal with some aspect of the forest or forest-related issues (Maini 2003), but forest policy promoted by most of these groups has not fully shifted to ecosystem management or adaptive management. Gale (1998) argues that international trade agreements and negotiations have constrained the adoption of an ecosystem-based approach because of the intense competition in the international market for unsustainably produced forest products. Timber producing states, even those in the northern hemisphere, have to focus policy making on remaining competitive, rather than advancing the principles of

³⁰ “Pan” is a prefix referring to the union of a specified group or all involved. Panarchies describe the diffusion of power or authority. Elsewhere I use the term polycentric to describe this dispersal.

sustainable forestry or ecosystem management. Sustained yield management of a small number of commercial species still dominates the forest sector, in spite of increasing recognition of the challenges in predicting and assuring annual harvests.

The adaptation of scientific recommendations into policy is carefully controlled to maintain the economic and political interests of key actors (Haas 2004). The neoliberal managerial environmental discourse draws its authority from science, which makes it more resistant, although not impervious, to deconstruction (Adger et al. 2001). Environmental management represents a technocentric worldview in which blueprint solutions based on external policy interventions should solve ecological problems. One of the concerns about technocratic planning is that women's work and resource use is often not evident to economic planners, foresters, land surveyors, or conservation biologists (Rocheleau 1995). The solution is not to merely add women to development analysis, but redefine technical constructs so that they are broader and more inclusive. This necessitates being open to the distinct experiences and sciences of different groups.

In technocratic and scientific circles, greater credibility is given to opinions couched in formal language, which may not be adequate for describing the complex, poorly understood, and changing experiences of rural populations in developing countries. The use of technical lingo alienates common people and makes decision making less accessible to them. Another concern is that outside practitioners often assume that communities will change their lives to fit external definitions. Sundberg (1998a) notes that a vision of the forest, based on a square grid composed of parcels to be harvested across thirty years, can be vastly different than local residents' customary understanding and use of forests. Technical management will probably not be

accepted immediately in Latin American villages, as I have observed in Nicaragua, where grid concessions can also regularly be found. Outside foresters that want local support must take the time to inform populations the reasons why they manage or harvest trees in a particular faction. If extraction is to be carried out on communal lands, foresters must get villagers involved in the process or in my experience it is likely that there will be misunderstandings about their goals and methods (author's fieldnotes).

A scientific contribution to environmental policy in recent years has been the identification of critical ecological zones (Campbell and Martin 2000; Olson and Dinerstein 2002). Around the globe, there are pockets of biodiversity conservation "hotspots" that attract funding from major conservation organizations. Hotspots are selected to balance species richness, endemism, and unusual ecological or evolutionary phenomenon with protection of all of the world's different biome and habitat types within each biogeographic zone that they exist (Olson and Dinerstein 2002). A set of terrestrial and aquatic ecoregions are focused on in order to preserve a representative sample of the broad diversity of the Earth's ecosystems. In the World Wildlife Fund's Global 200, a widely utilized assessment system, ecoregions were categorized as critical/endangered, vulnerable, or relatively stable/relatively intact based on change predicted over the next four decades. These future projections are somewhat subjective. For terrestrial regions, this required determining the rate of habitat loss, size of remaining habitat blocks, and degrees of fragmentation, degradation, and protection. After the ecological characteristics and functions of different zones were evaluated, issues such as remaining intactness of the ecosystem, or its conservation status, influenced feasibility and overall need for programs. I want to highlight, since it is often overlooked, that in final stages, the

selection process involves tradeoffs and there can be bias in determining the areas that are most critical.

A problem arises when many conservation organizations focus on the same areas, which they define as “hotspots,” (Sundberg 1998b, 2003b). Sundberg believes that hotspots are sometimes designed incorrectly. Once NGOs enter, this can lead to a balkanization of the landscape as each stakes its claim to certain areas (Sundberg 1998a). The NGO landscapes that they create reflect the goals of outside organizations and not necessarily the needs of the local people or ecosystem requirements.

With the amount of funding directed at hotspots, conservation organizations and the international finance institutions can dominate governance of a nation, region, or zone. Goldman (2004) is extremely critical of this process in Laos in recent years. He documents that the development process became so defined by outside forces that they dictated what was important or not based on their narrow goals. When social or environmental impact assessments did not support their framework, they either fired the scientist who dared to recommend another path, or merely failed to report the contrary information. Goldman notes that what is seen in scientific and technical reports is really a highly politicized version of research findings. Likewise, the “capacity building” within natural resource agencies in developing countries supposedly aimed at professionalization is actually a process to replicate their neoliberal approach to “green” science and build national support for international development planning. I have come to a similar conclusion after analysis of the Mesoamerican Biological Corridor, as presented in Chapter Six.

In my opinion, there is often insufficient ecological data to inform policy decisions in developing countries, and yet forest management initiatives in donor, state, and NGO documents are often justified for scientific reasons. Socio-political and economic discourse deeply impacts forest development policy in spite of claims of science-based planning. However, over time, a small portion of scientific findings do influence policy. For example, the utility of large-scale ecosystem analysis has been widely accepted in NGO and donor planning (Miller 1996). The maintenance of connectivity through the use of corridors is now becoming a popular policy concept in state landscaping and development planning (Bennett 2003; Carr 2004). Donors, environmental groups, and governments do appear at times to be influenced by scientific research, but only some aspects become widely adopted: those which benefit their institutions as well. For example, in the case of the Mesoamerican Biological Corridor, I agree with Kaiser (2001) that the large size of the project, which can be argued necessary to maintain ecological connectivity, was immediately seen as beneficial in terms of attracting and consolidating conservation grants from variety of key donors.

PART THREE: INDIGENOUS SELF-DETERMINATION

There has been a convergence of sustainable development and indigenous development, but these efforts often represent limited accommodation of indigenous peoples and cultures into the existing development system. While indigenous populations may receive benefits, such as employment or economic assets, land and self-governance issues are sometimes taken out of the spotlight and restrictions may be placed on indigenous control (Campbell 2003).

Much has been written on indigenous development. While recognizing the interconnection of important elements of indigenous self-determination, such as autonomy, self-governance, land, natural resources, language, religion, and cultural practices and integrity, I focus specifically on the self-governance of forest resources and communal land.

Land tenure is an important issue at all governance scales. Insecure land tenure, arising from challenges to possession as a result of ownership disputes, eviction, or government expropriation, is considered a major risk by foreign donors and investors (Feder and Nishio 1999). Land security demonstrates the functioning of a modern national economy and the achievement of economic, social, and environmental progress (World Bank 2002). Tenure security may provide incentives for investment and environmental protection, decrease land market transaction costs, and increase access to formal credit, among other benefits. Secure tenure also increases the value of the land in the eyes of local users. Moreover, land tenure security is linked to social justice. The World Bank has documented benefits for the poorest sectors of society due to the regularization of land rights as these marginalized populations are often unable to defend their informal usage when confronted with more powerful political and economic sectors. Land conflicts can, therefore, lead to their displacement.

Secure land tenure and a natural resource base, as well as the continuity of the relationship of indigenous peoples and their territories, is important to the survival of indigenous culture and native self-determination (Anaya 1996; van de Sandt 2003). Land and resources are the economic base for development in indigenous communities (Anaya

1996). Legal recognition of communal tenure is important, especially when it is combined with protection from land sale, alienation, dismemberment, or confiscation.

In some Latin American countries, indigenous common-pool land rights were retained from colonial periods and later reinforced. In others, they were granted in modern times. Yet, even in locations where collective rights are recognized by the state, such as Argentina, Bolivia, Colombia, Ecuador, Guatemala, Honduras, Mexico, Nicaragua, Panama, Paraguay, and Peru, indigenous populations still face severe challenges to control development activities in their territories (Van Cott 2000; author's fieldnotes).

In addition to legal recognition of land rights, indigenous populations need to be free from undue outside interference so that their institutions can function (van de Sandt 2003). Discrimination within state structures can interfere with these requirements because states in Latin America often recognize the natural resources, including subsoil deposits, within the entire sovereign national territory as government owned (Van Cott 2000). The state uses resources in indigenous territories to benefit national society, but these policies may undermine indigenous rights. In forestry, this sometimes involves granting private resource concessions without the consent of local populations. Other times it involves the creation of a park or protected area, which can annul, limit, or restrict local access and tenure rights to the area (Colchester 1997). Indigenous people often resist state and private appropriation of their resources in order to defend their livelihoods and maintain their cultural identities (Castro and Nielson 2001).

Communal areas customarily used by indigenous populations often lack formal land or property titles. Indigenous resource institutions are often distinct from the

dominant, Western concept of individual private property because they combine individual and collective rights to land, trees, and other important resources (van de Sandt 2003). A variety of site-specific tenure systems have evolved. In many cases, while the rights to particular areas or resources may be allocated on a long-term basis to individuals or households, the control and management of the larger communal area often lies with the community. In many parts of Central America, socially recognized *de facto* land rights are more relevant than formally mandated state ownership rights (Netting 1993; author's fieldnotes). Even in areas that are not communal, tenure is often demonstrated through occupation and use or through making improvements, such as clearing, planting, building fences, or putting in infrastructure.

Indigenous development strategies tied to land regularization programs aim to reduce conflict over tenure, strengthen community organizations, and lay the groundwork for natural resource planning and development. While there are programs directed specifically at indigenous benefit, local populations are also sometimes viewed as tools to help achieve predetermined conservation and development goals. In the case of Nicaragua:

It is expected that when indigenous and ethnic communities have fairly secure tenure of land, they will represent a formidable barrier to the expansion of the agricultural frontier and will contribute significantly to sustainable use and conservation of natural resources (World Bank 2002: 11).

In some countries, there may be a person with a definitive title, another with a provisional title, another with a bill of sale, and an occupant all looking to demonstrate ownership of the same parcel. Policies focus on linking tenure security to improvements in productivity and economic opportunities, such as access to bank credit (Feder and Nishio 1999). This may not be relevant, however, in rural areas where there are no

lending institutions or where there they do not make loans small enough to be managed by local producers.

According to neoliberal policies, rural development is linked more to clarifying property regimes than land redistribution (Nygren 2004), although the U.S. government has pushed for land reform in many Latin American countries. In areas where there is a high degree of pressure from changing economic circumstances, formal registration systems are important if they provide low-cost mechanisms for people to protect themselves from challenges to their informal rights (Feder and Nishio 1999). This is particularly imperative for low-income and indigenous populations, who are more likely to have informal tenure. However, there are several challenges to this approach in developing countries. If financial and land markets are not functioning properly, secure tenure may not by itself resolve development constraints. Moreover, the introduction of a modern registration system to replace customary tenure institutions may provide opportunities for “land grabbing” by individuals who are wealthier, more informed about formal processes, or better networked with state officials. This can occur when an individual claims what was previously communal, state, or open access land. Alternatively, they may challenge the individual ownership of a person who is less able to defend his or her claim. In addition, with a more active market and increasing land values, low income populations may be enticed to sell their land. Over time, this could create a large landless class and increase social instability. In some locations, however, indigenous people have been able to spontaneously take over big landholdings without governmental programs. In some places, they purchased the land, but in others, it has been taken through invasion.

The policy of large international development institutions has vacillated over time between restricting indigenous involvement in land markets and promoting individual and freely transferable land tenure structures (Plant and Hvalkof 2001). The restriction of land markets has been associated with low productivity and agricultural inefficiency. Yet, historically in Latin America, the opening of land markets in indigenous areas was believed to increase inequality because there was a tendency toward the concentration of land in the hands of the wealthy. Recent advocates of market-oriented land policies believe problems resulted from inadequately titled and registered land so that some beneficiaries did not receive title and others were granted areas that overlapped with other titles (Plant and Hvalkof 2001). With indigenous populations, an important part of any demarcation process is the clarification and resolution of any contradictory claims. This needs to occur before titles are granted so that there is full legal clarity supporting indigenous possession.

Agreement is lacking over the best approach to indigenous land rights. Three main approaches can be identified. They may be complementary, overlap, or conflict, depending on the particular circumstance (Plant and Hvalkof 2001). The first is a protective approach. This is based on the notion that native peoples need special protection from market forces. Historically this approach was aimed at essentially isolating indigenous groups with the creation of indigenous reservations and reserves. It is also evident in Latin American legislation that places restriction on indigenous land sales or transfers by mandating that it is inalienable and cannot be mortgaged. The second is a rights-based approach, which focuses on historical land claims and argues for the recognition of indigenous rights within the legal structure of a multi-ethnic state. This

approach places emphasis on the need to reverse past injustices and discriminations to promote equity and equal opportunity before the law. The third is an environmentally or ecologically determined approach. Advocates for this approach argue that indigenous populations have the greatest capacity to manage natural resources in ecologically fragile zones. This approach may be more concerned with the protection of the environment than with the human rights of indigenous populations, although sometimes these goals are treated in conjunction.

Scale in Indigenous Development

The United Nations declared from 1994 to 2004 as the International Decade of the World's Indigenous People. There were advancements in this period, such as the creation of an indigenous-led United Nations Permanent Forum on Indigenous Issues, and progress towards a Draft Declaration on the Rights of Indigenous Populations. Nonetheless, the vast challenges that remain outweigh gains to this point (Lutz 2004).

There is precedent to show how issues of scale are fundamental to indigenous struggles. Howitt (2003) discusses how indigenous rights have historically been violated at every scale. International rights have been stalled in order to protect national sovereignty. Transnational institutions have restricted indigenous access to international arenas for legal and political redress. National and sub-national governments have established legislation that sought to ignore native economic and territorial rights. At the scale of the tribe, treaties were dishonored and groups were displaced, relocated, and resettled. At the scale of the family, children were taken and forcibly integrated with non-native society. At the scale of the body, cultural practices, such as the use of language, were outlawed. Personal names were changed to not reflect native origins.

Today, environmental policy is couched in a rationale of bettering problems and safeguarding biodiversity for the common good of humanity (Goldman 1998; McAfee 1999). However, what is considered best for the global good may not be conducive to indigenous well-being. Native populations have been relocated from protected areas and their livelihood options closely regulated in attempts to protect global biodiversity. This is a “scaled up” version of earlier claims that state programs should do what is best for the good of the nation and the largest number of citizens, even when policies did not respect the rights of minorities, such as indigenous populations.

As many as eighty-five percent of the world’s protected areas today are inhabited by indigenous populations, as are most of the remaining high biodiversity tropical forest areas (Colchester 2000). The increase in the scale of conservation territories has clear implications for indigenous self-governance (Brosius and Russell 2003; Chapin 2004). Adding more levels and promoting higher scales of governance may take decision making roles away from the local scale. It may also concentrate power at higher governance scales, where indigenous populations tend to be poorly represented.

Indigenous affairs were historically considered local issues with oversight from national governments. In my analysis, over recent decades, “glocalization” has occurred in many countries. Indigenous organizations have jumped scale to lobby support from higher governmental and nongovernmental institutions. Meanwhile, national governments have increasingly recognized international human rights norms. Simultaneously, decentralization policies have targeted indigenous populations in some countries, thereby increasing their decision making power. Semi-autonomous indigenous territories now exist in some Latin American countries, including Colombia, Ecuador,

Nicaragua, and Panama (Van Cott 2000). Nevertheless, some of these same countries, and many more in Latin America, have not ratified the International Labor Organization's Convention 169 (ILO 169) on the rights of indigenous peoples, which has been in force since the early 1990s and is considered a base document for international recognition of native rights. While both local organizing and transnational networks have increased indigenous voices in the international development arena, major improvements in multi-scale participation and representation are still necessary.

The persistence of assimilationist attitudes and arguments for state sovereignty continue to interfere with indigenous self-determination. Across time, political scales and structures have been used to marginalize native populations and challenge their control over natural resources. Silvern (1999) demonstrates how the political construction of scale was used in resource conflicts between indigenous populations and different levels of governments in the U.S. in recent centuries. Although there were tribal norms regulating subsistence activities, such as hunting and fishing, decisions in both federal and state courtrooms sought to expand and maintain governmental authority over indigenous populations, their economic development, and use of natural resources. These practices continue. Silvern (1999: 665) states:

Geographical scales serve to facilitate the power of the dominant society to control, exclude, and marginalize native populations. The established scale structure is supported by normative assumptions that deny the possibility of independent indigenous political authorities within a state's political space. Furthermore, although socially constructed, those in power defend the established political scale by representing it as natural, normal, and fixed.

Collaborative mapping is one method that has been used to challenge dominant constructions of space that marginalize indigenous groups. Participatory mapping has become a key element in much research and development work in Latin America (Knapp

and Herlihy 2002; Herlihy and Knapp 2003). Pioneering work was completed in the Caribbean regions of Honduras (Herlihy and Leake 1997; Herlihy 2001) and Nicaragua (Nietschmann 1995; Hale et al. 1998; Gordon et al. 2003; Offen 2003). In both areas, maps of indigenous tenure drawn in conjunction with local populations in the region differed greatly from state conceptions of rights. Mapping lands can be an empowering process for local populations and maps may help to demonstrate historical land use and validate indigenous claims. For example, in the case of Awas Tingni, the indigenous village that charged the Nicaraguan state in international courts with violating their untitled communal land rights, and won, setting an international precedent, participatory maps were an important piece of evidence.

As participatory mapping projects are common today, some may claim to involve local populations, but in reality their input is limited. Like non-participatory co-management partnerships, non-participatory mapping can further marginalize communities while strengthening the outsider's control over resource policy, management, and allocation. Sometimes consultations with local groups are designed primarily as venting outlets with the hope that if impacted populations are allowed to let off steam, they will not challenge the "co-management" project (Castro and Nielson 2001), or mapping process, itself.

In addition to the continuation of racism and widespread misconceptions about indigenous groups that historically limited the effectiveness of policies to defend their rights, there are major problems with the implementation of reforms that have been enacted. The classic conservation approach, using top-down, technical approaches to create "fortress" conservation areas and limit resource "mismanagement" by local users,

has been damaging to indigenous groups and the recognition of their rights. Colchester (1997) summarizes the main historical problems for indigenous populations as a result of a “classic” conservation approach. First, mainstream conservationists often see the preservation of nature above the interests of human beings. Second, their views of a wilderness separate from society are often at odds with an indigenous cosmovision. Third, alliances with the state in order to strengthen the authority of outside conservationists to regulate human activities can create conflict with indigenous goals and rights. Fourth, conservationists tend to be as prejudiced against indigenous populations as the rest of society is and their biases and stereotypes encourage the creation of inappropriate policies and projects. International conservation groups often have greater access to funding and to political spaces than indigenous populations and, therefore, have considerable power to harm or help indigenous populations.

The rights and well-being of indigenous populations have not always been protected within conservation projects. A major split often continues between indigenous agendas and those of conservation groups. In 1996, the International Conservation Union (IUCN) and the World Wildlife Fund (WWF) presented their “Principles and Guidelines on Indigenous and Traditional Peoples and Protected Areas.” This was one of many declarations and policy documents circulated on the topic. Like others, the IUCN/WWF document stated that there was a potential for inherent conflict between the objectives of conservationists and indigenous peoples. Nevertheless, it called for co-management, respect for indigenous populations, and recognition of their knowledge of the environment. Although policy statements like this attempt to account for indigenous peoples’ interests, native populations often point out that they are sub-standard in relation

to established human rights guarantees and that the policies suggested are often not implemented (MacKay and Caruso 2004).

International conservation organizations and state agencies both have a poor record in respecting indigenous rights. The action plan from the Fifth World Parks Congress in 2003 acknowledged past mistakes, including resettlement and forcing mobile populations to become sedentary, and called for an urgent re-evaluation of policies. It recommended the establishment of mechanisms for the restitution of lands incorporated into protected areas without indigenous consent and redress of grievances in violated populations by 2010 (Carino 2004). The closing statement of indigenous delegates at the congress charged: “First we were dispossessed in the name of kings and emperors, later in the name of State development, and now in the name of conservation” (quoted in MacKay and Caruso 2004: 14).

In general, international conservation organizations do not get involved in political issues considered outside their mandate (Colchester 1997; Chapin 2004). Indigenous populations often want to initiate conservation and development projects with a campaign for the legalization of their land rights. Conservation organizations with partnerships with state governments frequently shy away from land tenure disputes and, therefore, do not support native land rights campaigns. There is a tendency for international conservation organizations to seek alliances with the government because they are looking for the legitimization of their goals and the authority to implement their projects (Colchester 1997). Many environmental groups are reluctant to support indigenous peoples struggling against oil, mining, logging, and pharmaceutical companies as they interpret these issues as within the mandate of state governments

(Chapin 2004). National governments in developing countries often support resource extraction and resent outside interference in these economic activities. Since some of these resource firms have headquarters in North America, the U. S. government often also supports the resource extraction. USAID, meanwhile, is a major source of funding for large conservation groups working in Latin America. Moreover, since large conservation groups increasingly accept large private donations from multinational corporations, they are more hesitant to criticize commercial extraction. Although there are exceptions, the partnerships and linkages between some conservation groups, states, and firms mean that their support for indigenous peoples is often limited.

Chapin (2004) also suggests that a reason that large conservation organizations fear assisting indigenous peoples to gain tenure to their lands is that their leverage over the conservation practices of native populations would be eliminated. Conservationists may believe that indigenous populations could decide to log the forests if they were given full control.

Chapin (2004) documents three interrelated processes that suggest a resolution to indigenous-environmentalist conflict are not likely to be resolved in the immediate future. First, partnerships between several large conservation groups and indigenous populations have lost ground over the past decade. Second, competition over conservation money has intensified and partnerships between corporations, states, bilateral and multilateral donors, and conservation groups have advanced. Third, grants for environmental protection in indigenous areas continue to be given to conservation groups instead of indigenous groups or organizations that have native rights as a primary goal. Four, large

conservation NGOs often work as “gatekeepers” of external resources in developing regions, which gives them considerable influence. Chapin (2004: 26) states:

This results in two layers of controls: first those from the bilateral and multilateral donors, and second those from the international NGOs that do the re-granting. When funds finally trickle down to the local NGOs, they are often so tangled in strings that the locals have little room to carry out their own programs. In any case, these funds tend to be minimal; most stay with the large NGOs.

Chapin (2004) documents another even more alarming trend amongst some conservation organizations. At the onset of potential partnerships with environmental organizations, some indigenous populations cooperate because they view the alliances as potentially beneficial. When later indigenous actions collide with prior stereotypes, international support may become weakened. Due to the lack of success in programs deemed as participatory and targeting indigenous populations, some environmental groups have backed away from working with local populations who they criticize for what they interpret as a lack of interest in conservation. This sends alarm signals through the environmentalist community because so much of their justification for alliances with native populations was based on stereotypes, such as the ecologically noble savage (Redford and Sanderson 2000). Traits identified as authentic “Indianness” in places such as Brazil and Nicaragua contradict the actual realities of many native peoples’ lives (Conklin and Graham 1995; Ramos 1998; author’s fieldnotes).

Some ecologists insist that protected areas should be separated from human development initiatives (Redford and Sanderson 2000; Carr 2004). Based on this line of thinking, Redford and Sanderson (2000: 364; emphasis added) state, “Conservation *with* use should not crowd out conservation *without* use as a policy objective.” Some environmentalists propose that they must protect biodiversity even if local groups are

against their conservation campaigns. This can lead to competition to frame the local situation so that it generates support either for the indigenous or the conservation agenda. Conservation organizations are often more successful than indigenous groups in generating financial support and media coverage for their initiatives. The funding gap is huge. MacKay and Caruso (2004) document that some of the largest nongovernmental conservation organizations have budgets greater than those of the entire state in some developing countries in which they operate.

Overall, funding is a thorny issue for many indigenous organizations. Aid from state, NGO, or donor agencies can create dependency and limit organizational autonomy through the creation of patron-client relationships, especially with state funding (Sawchuk 1998). Indigenous groups may accept state funding because they view it as owed to them as compensation for lost resources. Yet, governments may expect funds to obligate indigenous populations to cooperate on particular programs or policies.

The development of culturally appropriate organizational structures is another controversial topic. There has been a trend in Latin America to treat indigenous populations the same as other marginalized groups and encourage them to organize in cooperatives, peasant organizations, and other non-indigenous structures (Assies 2000). With the creation of an NGO or political party, indigenous groups sometimes adopt their political practices to the dominant society. This can provide them with valuable organizational experience and increase their legitimacy in front of other political actors that they may have otherwise lacked, but it does have its costs (Sawchuk 1998; author's fieldnotes). Leaders working within non-indigenous political circles may alienate their base and create conflict between sectors who would like to maintain traditional structures

and those who believe that there are benefits to be obtained from reforming customary practices to conform to mainstream society.

In my experience, indigenous participation in conservation projects is sometimes used as a tool to achieve predetermined goals. When implemented such that major power inequities persist, participatory practices can lead to backlash against projects, as well as encourage the disintegration of community institutions. A common problem is the process by which representatives are chosen to communicate community demands (Castro and Nielson 2001; author's fieldnotes). Those selected may not represent the views of marginal village groups, such as women, low-income populations, or ethnic minorities, in planning activities. They may not pass on information obtained during consultations or training sessions to other community members, or they may choose to inform only some sectors of society (Van Cott 2000). Conservationists aiming for local participation face difficult choices in establishing appropriate structures because traditional decision making is sometimes vested in leadership structures that are top-down or marginalize sectors of society (Colchester 1997). If conservation groups work with local elites, they can exacerbate inequalities in gender, class, or race or exaggerate conflict within communities.

There are often problems in the way that local representatives are involved in development networks, including those claiming to be undertaking co-management. Although local populations may be consulted at some point, the decision making power is often not sufficient. The timing and process of participatory consultations appear to be very important factors in the success of projects.

Integrated into a discourse of socially inclusive neoliberalism, indigenous demands have increasingly come to be understood in terms of “development with identity” (César Perafán 2000). Indigenous populations often aspire to improve their economic means, but simultaneously do not want to lose their culture or specific forms of organization that have evolved within their local ecological and social context. It is often recognized in the development literature that native populations need to reduce dependency on states and donors. A solution frequently promoted is joint ventures involving mutually beneficial alliances with private and state sectors. The general idea is that if projects restore the economic base of indigenous populations, other development goals will fall into place, such as improved standard of living, self-esteem, community spirit, and self-governance (Anderson and Bone 2003). However, ventures in indigenous areas that start off as communal or cooperative risk the strengthening of local elite or increases in economic and social inequity (Mitchell 1996). Although new conservation models reverse earlier trends limiting indigenous access to natural resources, such as occurred under earlier protected area projects, many currently popular approaches are still not designed to address the particular attributes and needs of native groups.

The attention to indigenous needs in wider development programs has been inadequate. During the last years, multilateral institutions and national governments have increased their efforts to eradicate poverty in indigenous populations since they are often one of the poorest sectors of society (César Perafán 2000). Yet, in spite of these efforts, the economic gap between indigenous populations and the rest of society has increased.

Escobar (1996: 50) states, “As they are incorporated into the world capitalist economy, even the most remote communities of the Third World are torn from the local

context, redefined as ‘resources’ to be planned for, managed.” The tone of many “development with identity” reports depict the process that Escobar describes. For example, in a report for the Inter-American Development Bank, César Perafán (2000) informs that indigenous populations often make up ten to fifteen percent of the total population of Latin American countries, although there is often a statistical range depending on what criteria is used (e.g., ascendance, cosmovision and customs, territorial integrity, language, or self-designation). Considerable time and energy is spent defining indigenous peoples (see also Plant and Hvalkof 2001).

Indigenous populations are targeted in development programs because they tend to possess three important assets: social capital, land, and access to natural resources. For César Perafán (2000), indigenous economic involvement and decision making can be explained by factors including poverty, discrimination, marginalization, lack of guarantees, social capital within the group as opposed to with outside groups, and lack of capacity to compete in the market. There continues to be the highest indigenous involvement in the less profitable primary sector focusing on the production of raw materials and less in the transformation of products or in the service sector, which often generate greater economic benefits.

César Perafán (2000) elaborates three methods used to eliminate limitations in the flow of financial resources to indigenous populations: the privatization of land tenure, microcredit, and investment in social services. He notes that these programs have not substantially changed indigenous marginalization in the secondary and tertiary economic sectors. Nor have they contributed to flow equity between savings and investment. The idea with land privatization is that indigenous populations will use their land as collateral

for bank loans; however, in some cases, this has been demonstrated to be irrelevant to their access to credit. In addition, César Perafán reports that there have been cases in Latin America whereby indigenous populations rejected programs of privatization. He suggests that the market-based approaches that have been implemented have generally not reduced indigenous marginalization or poverty. Meanwhile, he believes social service provision and microcredit programs are inadequate.

Godoy (2001) suggests that there are essentially three main perspectives on the government's role in addressing development of lowland indigenous populations. Some would like to see indigenous peoples left alone and thereby minimize the effects of markets. Others propose to allow markets, encroachers, and cultural contact to continue unfettered by regulations. A third group would like indigenous groups to have more autonomy to make decisions about the future. People following this approach often promote governmental intervention with public investment to level the playing field so that indigenous populations have increased opportunities than they generally do now. They also support laws safeguarding indigenous property rights.

Institutional chaos in rural areas means that state policies are unlikely to have their intended consequences (Godoy 2001). Public policies supporting market integration may either be beneficial or devastating to rural communities as a result of the existence or lack of additional state programs. Even in areas with NGOs, church groups, international donors, and other support programs, the lack of coordination may mean that necessary transitional policies are absent. These types of institutional weaknesses make it difficult to accurately gauge the implications of market integration.

The World Bank and other international financial agencies have begun to prioritize institutional development. However, Godoy (2001: 207-208) accuses international development organizations of largely ignoring primary research on public policy among lowland Indians.

More interested in pushing money through safe projects with visibility and doing what the Washington consensus demands than obtaining better information to help governments formulate policies, large international bureaucracies lack vision of where to go with indigenous people...Until officials in government and development organizations have more information and a better understanding of lowland populations, they will find it hard to put policies in place that bring about progressive changes. Knowledge, of course, will not substitute for the lack of political will. Both will need to go hand in hand.

Marketing of Indigenous Forest Commodities

Forest product trade dates back to the early human settlements. Commercial international exchange of forest commodities has a long history in Central America as it does in many parts of the world. For centuries after colonization, indigenous populations worked as laborers in extraction of precious woods, such as mahogany. Although there were instances of forced labor, in Nicaragua's Moskitia, indigenous people generally chose to trade items from the forest, like timber, dye, and rubber. Their extraction ebbed and flowed with market shifts. Nietschmann (1973) shows that the Miskitu who adopted capitalist economic practices did not always protect ecological balance. Economic booms were often followed by bust periods, sometimes due to overextraction in earlier periods.

Many Latin American indigenous groups pragmatically recognize the utility of engaging in market activities (Plant and Hvalkof 2001), but the results they experience are diverse. Some of the best research on the impact of markets on indigenous populations has been orchestrated by Ricardo Godoy (Godoy et al. 1995, 1996, 1997; see also Sierra et al. 1999). Sierra et al. state that there is considerable uncertainty

surrounding local changes in forest use with increased market access and trade. Likewise, Godoy (2001: 203) states, “There is no unified theory to explaining in a parsimonious way what happens to the habitat, society, ideas, quality of life, and material culture of indigenous people as they become part of the market.” He believes that many times the results of market interventions are at best unclear, although he admits that they are likely in many cases to have both benign and harmful effects on quality of life and the environment.

Godoy et al. (1997) propose that there are at least three main positions on the impact of markets or economic development on conservation. The first position suggests that markets hurt conservation through processes such as agricultural intensification and deforestation. The second proposed that markets can enhance conservation as long as secure property rights exist. Lastly, some researchers believe that the market produces ambiguous effects on deforestation. The contradictions between these positions, Godoy et al. believe, arise from the fact that most researchers have focused on documenting deforestation, rather than presenting models or testing hypotheses on the conditions under which markets may harm or help. Further, researchers have not looked at whether their findings hold in situations of different types of market integration; for example, households and individuals may sell crops, labor, land, non-timber forest products, or timber. Each may have different implications for quality of life and environmental health. Once income rises, market and subsistence strategies can change dramatically.

There is considerable complexity related to market impacts, suggesting that it is inappropriate to create blanket conclusions. One of the strongest arguments of the negative implications of markets for indigenous populations is the increase in inequality.

However, Godoy's (2001) work in several Latin American countries, including Nicaragua, found inequality often existed in village economies and that reciprocal exchanges and support to other community members in need was not as prominent or common as expected. He also found that it was difficult to make generalizations about economic choices within a village. There was considerable variation in willingness to delay gratification or work in various conditions or sectors. Some villagers may be willing to work for wages, while others would likely chose not to.

Godoy (2001) criticizes much micro-scale analysis of markets because it takes different degrees of exposure to markets without looking to explain why some villages, households, and people are more linked than others. He also notes that variation in exposure to the market often comes from processes that originate outside of villages. This can be missed in micro-scale studies that do not look beyond the local scale. Gaining an understanding of economic choices requires analysis across time or space. Much of the research on the use of tropical flora and fauna has been done in too short of a time to detect and document variation, although there are exceptions (e.g., Nietschmann 1973). However, even long-term studies face the challenge of assigning economic values to goods that are not traded and to the opportunity costs associated with people's time. The controlled quantitative comparison of economic aspects of indigenous decision making and livelihoods is challenging (Knapp 1991). Methods of analysis are not universally agreed upon. Godoy acknowledges tradeoffs in data quality due to the sections of sites, which suggests that even within a small area, it would be necessary to test results in various sites. Godoy's findings reinforce the need for in-depth, long-term, multi-scale research focusing on details of decision making and options.

In some situations, higher incomes may lead to increased investment in activities other than forest extraction, such as livestock rearing. Godoy et al.'s (1996) fieldwork in eastern Honduras found that cattle provided important sources of savings and investment income for indigenous populations in the absence of modern financial institutions, although they were concerned about the need to clear forest for pasture. The linkages between forest policy and ranching are particularly important in the study area. A commonly repeated phrase in eastern Nicaragua is "*Ganado significa ganancia*" (Cattle signifies earning) (author's fieldnotes). Wealthier sectors of society have invested in livestock and several development projects in the area promote ranching to alleviate poverty.

Although an argument can be made that capitalism has frequently resulted in the disempowerment of indigenous populations (Mann 2003), some native groups have begun to organize corporations as a means to empowerment and economic justice while inserting native control over natural and cultural resources. These native-run companies may enter into the globalized economy, network with firms, states, and nongovernmental associations, and reorganize their self-governance bodies and institutions (Anderson and Bone 2003). Analysis of these cases demonstrates new ways that indigenous populations can construct scale to their benefit and network extra-locally, as discussed later with the case of the Meadow Lakes Tribal Council and their investments in Nicaragua.

Based on work in Canada, Newhouse (2003) describes the adoption of capitalism in aboriginal societies. In describing "capitalism with a red face," Newhouse claims to have never seen outright rejection of capitalism, but rather documents that indigenous peoples formulate a particular political-economic system that integrates capitalism with

native belief systems. Groups may combine modern and customary practices to create financial institutions that recognize broader social goals in terms of physical, mental, emotional, and spiritual aspects of development and integrate indigenous relationship to the land with economic development.

Anthropologists such as Faiman-Silva (1997) have traced the impacts of multinational corporation penetration into indigenous nations. Her work with the Choctaw of Oklahoma intricately demonstrates changes in scale from more customary levels of household, village, and regional institutions to actors in the global economy as laborers for the timber industry. What is important about this type of work is the attention to the variety of indigenous responses across time as groups forge a path to both maintain cultural integrity, including practices such as subsistence production, collective ownership, and decision making, and to develop economically.

Ventures in indigenous areas that start off as communal or cooperative ventures may lead to the creation of local elite, increases in economic and social inequity, and eventually spur private enterprise rather than communal businesses. Mitchell (1996) demonstrates this pattern in her study of Canadian Inuit. She discusses how indigenous cooperatives were riddled with contradictions that lead to the solidification of class relations. Although they were supposed to advance collectivity, the communal ventures ended up promoting individualism, private ownership, and competition. There were elements of the indigenous economy that continued, such as subsistence hunting and gathering, simple-commodity production, and social assistance, but they were often overpowered by the capitalist mode of production. This is precisely why I am concerned about the transfer of commerce-based conservation to Prinzapolka.

Mitchell (1996) discusses another trend that is particularly relevant to this study of Miskitu entrepreneurship. As native populations organize business ventures, they often become more vocal of their rights due to the fact that they have greater resources to mobilize, more awareness of structural inequities, and more experience in making themselves heard in outside circles. Mitchell found that these tendencies led to increased demands from the state in terms of land rights. However, she believes that the target of the state legitimized the government's claim to the Arctic. Similarly, in Nicaragua, some indigenous organizations believe that the state cannot determine indigenous land tenure because it lacks authority over the Moskitia (Offen 2003; author's fieldnotes). As Miskitu groups are brought into development projects, they may become more aggressive about the recognition and demarcation of their lands by the state, but in doing so they could legitimize the government's ability to determine their rights. This is a concern because in Latin America, state policies frequently contribute to the privatization or state control over communal resources, while at the same time they ignore tenure conflicts that threaten indigenous resource control.

Even in developed countries, such as Canada, where there have been major advancements in the participation of indigenous populations in resource development, Nadasdy (2003) shows that unequal power relations have meant that indigenous knowledge is not valued. There may be abstract support from some policy makers for the integration of traditional ecological knowledge with scientific findings as a framework for management. Yet, what often occurs is that the integrated knowledge is no longer representative of the local beliefs, values, and practices that formed it. Those in power, and Western scientists, decide how the knowledge is gathered and used. The knowledge

is altered to fit a non-indigenous worldview. Nadasdy (2003) notes that the strengths of indigenous knowledge are often lost: when it is holistic, it may be compartmentalized; when it is rich in breadth, it is distilled; and when it is local and based on relations to a place, it is universalized.

Indigenous people are increasingly involved in global natural resource marketing, most often as laborers, but in some cases, as owners of community private enterprises. There is the potential for both positive and negative implications for indigenous populations as a result of the involvement of transnational institutions. International organizations, such as the Forest Stewardship Council (FSC), draw attention to social justice issues, such as indigenous land rights, in comparison to conventional lumber marketing. Nevertheless, the actual understanding of these international bodies of specific indigenous rights in each of the countries that work is slight. Evaluators are not always aware of institutionalization of racist land and resource policies in particular nations (Brook 2003, 2004). For this reason, I support the on-going broadening of representation in existing governance bodies, such as the FSC. At the same time, since outside institutions often do not give equal attention to indigenous views, it is important for native institutions to continue to develop independently.

CHAPTER TWO

Nicaraguan Aid and the Global Development Business

This chapter focuses on important actors in international governance related to sustainable development and forestry policy. It begins by summarizing international players' activities in Nicaragua. Transnational forest development networks often involve the same core of donors, consultants, and agencies, such as the World Bank, United States Agency of International Development (USAID), and World Wildlife Fund (WWF). These institutions have formulated a preferred set of sustainable forestry projects, several examples of which are presented in the latter part of this chapter. Chapters Six and Seven discuss the implementation of these forest development models within Prinzapolka.

Development programs aimed at the forested commons in eastern Nicaragua involve a synergistic re-scaling of governance and economies. The stories that unfold in this work demonstrate recent transformations in the way that indigenous Miskitu utilize, value, and govern their shared forest resources. The transitions described in this study did not occur suddenly; rather, they built slowly through centuries of marketing and governance. In recent years, economic and political shifts resulting from multi-million dollar development projects have compounded to accelerate change in certain villages.

Centralism in Latin America historically served a small elite group (Baltodano 2002). In Nicaragua, it has been tied to an authoritarian system of governance with political *caudillos* (patrons). Decentralization is, therefore, seen to offer an opportunity for the recuperation of citizenship, transparency, governability, and democracy (Morris

1992; Ribot 2004). Decentralization is a global trend. At least fifty countries currently claim to be decentralizing some aspect of natural resource management (Agrawal 2001a).

In 1990, when the Sandinista administration was voted out of power and a new administration supportive of neoliberal policies entered, decentralization reforms that Sandinistas had initiated continued. Global institutions pressured for the initiation of economic reforms, including structural adjustment. Trends toward decentralized and supranational governance later combined with changes in forest product markets, development aid, and international conservation policy, to influence the management of the Miskitu commons in discursively and materially complex ways.

International donors and state agency policies interacted with other transformations already in motion. Indigenous self-governance was being reformulated as a result of the 1987 Sandinista Autonomy Statute, which instigated three major transitions relevant to forest management. First, it legally recognized communal land and natural resources in indigenous villages. Second, it recognized official indigenous village leaders and asserted their power by requiring their approval for natural resource and land transactions. Third, it created an autonomous multi-ethnic regional government as a new site of struggle over ethnic and resource rights. The combined implications of these reforms emerged slowly as new institutions developed and conflict over forest resources emerged. Forest resources were increasingly contested in the context of a boom in the extraction of big-leaf mahogany in the mid-1990s. Less than a decade later, there was an influx of development projects involving joint ventures between aid agencies, the state, corporations, NGOs, and indigenous villages. This is the focus of my dissertation.

The philosophies behind foreign aid have gone through three major phases globally (World Bank 1998). In the first, the government was seen as the solution to market failures. In the second, markets were seen as the solution to government failure. The third, and current stage, acknowledges that both markets and governments have pervasive problems. Development strategies should target the strengths of the private and public sectors and avoid their weaknesses. This strategy is fundamentally neoliberal, as it is built upon growth-enhancing, market-oriented policies, but it also calls for some public provision of services not sufficiently or equitably supplied by markets. There is also more attention to how policy failures, weak institutions, and gaps in public services can create severe constraints to economic growth.

Sustainable development is a paradigm that interprets conservation and development as synergistic, or at least compatible. Sustainable development was originally envisioned in the 1980s as a critique to traditional economic programs that did not include social and ecological indicators. Controversy now arises from the adaptation and use of the concept of “sustainable development” by neoliberal institutions, i.e., the World Bank. There has been a shift from creating policies to stay within hypothesized natural limits of the Earth to finding the markets, technology, and institutions to push natural limits to sustain growth indefinitely.

Sustainable development is the dominant development discourse, although it is interpreted and acted upon differently. For some, sustainable development premised on sustained economic growth is an oxymoron (Rich 1994), because intensive resource use to feed growth is currently degrading the environment and cannot be sustained into the distant future. Nonetheless, sustainable development networks also broadened the

definition of development from one based predominately in economic indicators, such as per capita income and Gross Domestic Product, to standards including quality of life, human resources, and environmental conditions. Nevertheless, international critics such as Rich (1994) Escobar (1995, 1996) and Shiva (2003), among many others, charge that the focus on unfettered economic growth still surpasses concern over institutional development, human resources, or environmental protection.

NICARAGUAN ENVIRONMENTAL AID

Foreign aid is a post-World War II phenomenon with two main objectives. First, aid promotes long-term economic growth and poverty reduction in developing countries (World Bank 1998). It is recognized that for donor countries there are economic and security benefits from economic growth in poor nations. Second, aid advances the political and strategic interests of donors.

Environmental aid for the Caribbean region of Nicaragua is not entirely new. International donors implemented the Northeast Forestry Project from the 1950s to the 1970s in coordination with the state. Since the 1980s, in spite of regime changes, the Swiss government has been deeply committed to Nicaragua's forest sector. In 1990, at the end of the Contra War, the U.S. government allocated US\$300 million dollars to rebuild war-torn Nicaragua (Nietschmann 1997). The USAID was chosen to administer these funds. Twelve million dollars were directed towards natural resource programs. U.S.-based conservation groups won contracts for biodiversity protection and sustainable development programs. USAID and their NGO partners established environmental programs in the autonomous region with these funds and later received additional allocations. USAID contributed seventy percent of the budget to The Nature

Conservancy, the U.S.-based environmental NGO that took on administration of the largest protected area in the northern autonomous region, the Bosawás Reserve. At this point in time, USAID contributed approximately forty percent of Nicaragua's total natural resources budget.

USAID contributed to an Integrated Conservation with Development Program in eastern Nicaragua (IUCN 2000). The marine biological reserve USAID supported also received assistance from the two U.S.-based NGOs: World Wildlife Fund (WWF-U.S.) and the Caribbean Conservation Corporation. The impacted Miskitu started an NGO organization to act as the liaison between the outside environmental organizations and the approximately thirty coastal villages involved in the almost 13,000 square kilometer reserve (Larson et al. 1998; IUCN 2000).

Bernard Nietschmann (1991, 1993, 1995, 1997) recorded the failure of this marine reserve to achieve its goals. Nietschmann (1997: 215) described how after villages had given their permission for the creation of a protected area, USAID, in conjunction with the Nicaraguan state environmental agency and U.S. environmental groups, "changed the project's focus from 'community-based' to 'community participation,' then to 'consultation with communities,' and later to 'on the behalf of the communities.'" Without consulting with the indigenous populations, the Nicaraguan government altered the boundaries and size of the protected area. Nietschmann (1997) suggests that this change was made to create a larger area for commercial fishing in spite of indigenous opposition. The WWF later concluded that the marine biological reserve was not fully successful due to difficulty in negotiating communal property management agreements (Larson et al. 1998). This is an example of how conservation groups

disseminate blame for projects that do not meet their objectives. Nevertheless, even the WWF admitted that there was a growing lack of consensus on the effectiveness of ICDPs as a biodiversity conservation tool by the late 1990s (Larson et al. 1998).

The majority of financial resources supposedly directed at the indigenous communities in the marine reserve actually went to run external conservation organizations. At one point in the mid-1990s, seventy percent of the total budget of the Miami-based Caribbean Conservation Corporation was made up of contributions from USAID for this project. Of the total budget of \$1.9 million dollars granted between 1991 and 1995 to develop this coastal protected area, less than ten percent went directly to Miskitu villages or their NGO. The rest went to the Nicaraguan state and to U.S.-based NGOs. Aid given to this project, like much bilateral aid, appeared to be tied. Tied bilateral aid is used in large part to procure goods and services from the donor country. Randel et al. (2000) reported that over seventy percent of USAID assistance was tied.

Bilateral and multilateral aid from the U.S. plays a central role in Nicaragua. Bilateral assistance is administered through USAID, while multilateral aid agencies, such as the United Nations and the World Bank, administer pooled contributions from wealthy countries. Today, USAID continues to be important to the formation of Nicaraguan forest management policies. One way this is done is through the Central American Regional Environmental Project (Proarca). Proarca is financed by USAID and executed by TNC, WWF-Central America, and Rainforest Alliance. One Proarca component is called Protected Area and Environmental Marketing, which demonstrates the hybrid socio-environmental, market-based strategy of partner institutions. Proarca assists the

implementation of the Mesoamerican Biological Corridor and Nicaragua's Atlantic Biological Corridor, one of the core case studies in my research.

In Nicaragua's capital, USAID representatives lobby state officials for policy that makes environmental protection legally binding and is supportive of their projects. USAID encourages co-management between governmental, corporate, NGO, and village institutions. Projects are aimed at what a Managua USAID representative called "*mercadero proambiental*" (environmentally friendly marketing).³¹ Even in a small country such as Nicaragua, the development business is strong. More than four hundred development consulting companies from over thirty different countries, who already have experience working in Nicaragua, are soliciting contracts on the Internet. Many are from the U.S.

At the USAID offices in Managua, I asked a representative about Nicaraguan environmental programs. She commented that initiatives in the past years had been organized through the Central American Proarca office located in Guatemala. USAID-Nicaragua contributed to the Proarca budget, but was not involved directly in their environmental campaign. On forest activities, USAID-Nicaragua contributed funding to NGOs, such as WWF, that carry out on-the-ground projects. Yet, USAID is not entirely absent from the process. As one example, the environmental impact assessment for a project with WWF in Prinzapolka was sent to USAID offices in Washington, D.C for approval. These networks demonstrate how actors at various scales constantly link upward, downward, and outward. They also demonstrate the difficulty of mapping institutional linkages, as noted in my discussion of research methods in the introduction.

³¹ Pers. comm., Spanish, 11/27/03.

Transnational development institutions, such as USAID and World Bank, utilize a spatially dispersed multi-pronged approach for their campaigns. Linkages are different depending on the exact issue under review. For example, in a 2003 interview with a World Bank representative in Managua, I asked if the impetus for the forest development projects tended to come from within Nicaragua or from external actors. He answered that most were promoted from the outside. That was clear enough. Then I asked if the decisions were made in Managua or in Washington, D.C. His answer was that World Bank representatives practically anywhere could be responsible for various decisions depending on how distinct elements were linked to various bank initiatives.

In Nicaragua, the majority of multilateral aid for forestry comes from the World Bank. World Bank project and investment loans in the country from 2003 to 2005 were expected to total between US\$120 and \$160 million dollars. World Bank was a main funding source for a major forestry promotion office (PROFOR) in Nicaragua. At the time of fieldwork, the bank played a large role in the Nicaragua forestry sector through PROFOR activities, which are administered under the Ministry of Agriculture, Livestock, and Forests. Bank funding had also been granted to the “*Pro-Socio-Ambiental Forestal*” (Socio-Environmental Forestry Projects POSAF I and II), with the Ministry of Environment and Natural Resources.

Donors sometimes create temporary institutional structures within the state to guide reform. These institutions are generally under the mandate of a state ministry, but they are semi-autonomous in terms of having their own resources and goals. In Nicaragua, the World Bank has been prolific in the creation of such institutions: examples include the Forestry Promotion Office (PROFOR) (1997-2003) and the Land

Regularization Project (PRODEP) (2002-2007). These new offices reinforced centralized governance because they were tied to traditional bureaucracies and their economic and political linkages are strongest in the capital city. In spite of pressuring for decentralization, the vast majority of World Bank aid is distributed through central governments (World Bank 1998). This tendency contradicts decentralization and reduces the participation of sub-national government structures and local communities in the design and implementation of development projects.

PROFOR and PRODEP have significant resources, in contrast to the traditional state institutions working on the same issues. Certain pilot projects and their chosen target areas receive substantial financial support while the majority of the country is virtually ignored. These offices focus on specific development targets over a period of approximately five years. A temporary institution may be inefficient because considerable energy and resources go into the creation of new offices and programs that disintegrate at the end of their funding period. While there is some absorption into other institutions, there is waste as much knowledge and resources dissipate.

Under PROFOR, the World Bank funded another of the central case studies covered by this research in the municipality of Prinzapolka: the Forest Genetic Reserve and Seed Bank. The bank also funded a supplemental case study called the Pine Export Company (CEPISA) through PROFOR. While the majority of the PROFOR pilot projects funded at the national level involved plantations, projects in the Autonomous Region were in natural forests. The World Bank reversed its earlier ban of financing extraction from natural forests to fund these programs. The bank pressures recipients to work towards Forest Stewardship Council certification. These alliances and goals demonstrate

a global forest management trend central to this work: the use of markets as a key component of sustainable forestry. The bank reversed what was seen as a perverse incentive. Officials believed that by not funding sustainable logging, conventional domestic companies with poor extraction and inefficient processing wasted forest resources. Potential state income escaped through illegal practices. This is of interest to donors since these proceeds could have helped Nicaragua pay back foreign debt.

Donors invested millions of dollars in Nicaragua's forestry sector prior to 2000 and were not always able to see positive results (author's fieldnotes). An outside consultant working for the World Bank office in Managua in 2003 admitted that the bank is trying several different development models in Nicaragua because none have worked to this point. He categorized some previous forest development projects in the country as a "mess."³² According to a World Bank employee, after two years of consultations in Nicaragua, it was decided to use aid to invest in forests to reduce poverty (Tarrifa 2003). PROFOR's forest management projects fed into larger sustainable development goals. The World Bank supported plantations and the creation of wood markets, but only if the products meet international environmental standards and "critical" habitats were not logged.

An important difference in international aid over the last decade is the trend toward co-management, although decision making is rarely equitably shared with local populations, and co-financing with producers or impacted sectors. Forestry development increasingly involves nongovernmental sectors, which may or may not be representative of impact populations. In earlier decades, states were nearly exclusively expected to

³² Pers. comm., Spanish, 11/25/03.

implement development projects. Today, some governments of developing countries rely on NGOs to assist them to meet technical conditions imposed by international donors.

PROFOR began to change the vertical control of the Nicaraguan government in the past because the state established co-management partnerships (Tercero 2003). Under PROFOR, producers had to contribute part of the investments. Likewise, the land and natural resources, such as lumber for construction, used in development projects were considered counter-investment from the indigenous villages receiving aid. Sometimes villagers' work on development projects, for example construction of infrastructure, is also included. International finance institutions may require local investment to make up as much as ten percent of a total project budget (author's fieldnotes).

The World Bank insists on state co-financing for programs. In PROFOR, nine million dollars came from the bank, five million from private sources, and one million from the Nicaraguan state. Other forest sector aid came in from bilateral agencies, such as USAID and their Swiss counterpart, as well as environment and development institutions, e.g., the Ford Foundation and WWF. Under PROFOR, twenty-two million dollars were invested in private sector projects. The program included forty-six projects, which were chosen from 250 proposals.

A major change in the Nicaraguan forest sector in the past decade has been the increased participation from international conservation NGOs. WWF works through national and international networks to influence Nicaraguan policy and forest management. WWF provides financial and technical support for policy reform and on-the-ground projects with local communities. WWF's Central American initiatives are covered by an office based in Costa Rica and representatives from this office are

influential technical consultants on forest issues at a national level in Nicaragua, especially in pressuring for an increase in the levels of Forest Stewardship Council certified forest management. WWF is influential at a regional level as well. WWF-Bilwi maintains a permanent office and various employees in the capital of the RAAN and it has several projects in indigenous villages in the region.

WWF works closely with the RAAN regional government on projects and helped develop a twenty-year forest development strategy (2004-2024) (CRAAN/WWF-CA/INAFOR 2003). The plan involved consultations at national, regional, and municipal levels. WWF would like to connect the plan to the National Forest Development Plan and the National Poverty Reduction Strategy, both of which address indigenous forest management (Gretzinger 2003). WWF is encouraging the RAAN to be the first Nicaraguan region to implement the 2003 Forestry Law, which emphasizes forest certification, environmental services, and incentives for sustainable production.

The international nongovernmental conservation groups working in Nicaragua can be broken into two main groups. The first focuses on market-oriented sustainable forestry practices by encouraging additional processing and lumber certification to increase the value of the forest product extracted. The second type is comprised of international conservation agencies, which focus on goals such as species conservation, protected areas, and wildlife corridors. Some groups, like the WWF, fall into both categories.

While some international conservation groups are concerned about overall deforestation, others target the loss of particular species. In Latin America, big-leaf mahogany has received considerable attention in recent years because of an increase in

illegal trade. Trade regulations may help protect Nicaragua's remaining mahogany; yet, if illegal mahogany trade continues from Latin America, it is likely to continue in eastern Nicaragua, where international and national enforcement remains poor.

From the above discussion, it is clear that international actors played an important role in Nicaragua's forest sector. Donors influenced the policies of the standing Nicaraguan president, Enrique Bolaños (2003-2008). The Bolaños administration has been favored by international finance institutions due to his willingness to meet conditions for entry into initiatives for Heavily Indebted Poor Countries (HIPC) and his commitment to anti-corruption campaigns. Corruption was such an issue that during 2003, my main National Forestry Institute (INAFOR) research contacts at the municipal, regional, and national level were all charged. The World Bank and other donors could not force the previous Arnoldo Alemán administration to comply with their anti-corruption measures, but they were successful in leveraging support from Bolaños. By mid-2003, INAFOR's new executive director announced a strategic hundred-day plan to reduce illegal extraction and trafficking of lumber in regions such as the RAAN. He promoted the involvement of various sectors in this campaign, including the police, army, and civil society. The executive director announced that the World Bank would assist in creating a system of microchips that could be placed in lumber in order to more accurately follow its movement and stem corruption (Loásiga Moyorga 2003). State officials acknowledged the need for international financing to clean up the forest sector (López 2003).

In 2003, Nicaraguan forest policy focused on controlling illegality and creating accountability. According to INAFOR's director, as much as eighty percent of lumber that is exported is laundered. If these monies were captured, it could mean up to one

hundred million dollars in annual revenue (Aguilera 2003). A key goal was to strengthen and modernize forest management institutions. There was a philosophical switch to focus on production as a means to conservation. Forests under management plans were seen as less likely to be irrationally cleared for agriculture or in unsustainable harvest cycles. Recent policy also included incentives for forestry development, which is a switch from previous periods when legislation aimed largely at punishing violators.

The Law of Conservation, Promotion, and Sustainable Forest Sector Development was approved and entered into effect in September of 2003. The law would try to increase benefits to the general population, increase legitimacy in forestry institutions, and restructure corporate incentives to be more sustainable. Since it takes considerable time to implement new sector-wide policies, the following comments are preliminary and primarily address the intentions of the new legislation. Changes had yet to be implemented at the end of my fieldwork in December of 2003.

The new mandate would increase inspection of forest practices and sanctions for unsustainable practices. Instead of only decommissioning illegal lumber, INAFOR could auction the vehicles that transport this lumber as a further disincentive. Individuals or companies that worked illegally, and had wood decommissioned and auctioned as a result, would be prohibited from purchasing the same lumber through an auction, as frequently occurred in the past. A hologram on transportation permits would make these documents more difficult to falsify. The new forest law would give incentives to some logging companies, such industries for secondary or tertiary transformation, or those with forestry plantations, including tax exonerations. The law was more progressive than previous legislation in that it mentioned sustainable forest management certification and

the capturing of environmental services. Another change was that environmental impact assessments were required for all forestry management plans larger than five hundred hectares. Previously this was required only for those greater than five thousand hectares. This change was likely to change the scale of forestry operations. Since environmental impact assessments were expensive, contractors were already mentioning in interviews that they would either look to do larger areas to justify the cost of the study, or they would create plans smaller than 499 hectares to avoid assessment (author's fieldnotes).

President Bolaños was encouraged by international donors to carry out extensive development planning. He planned to execute a National Forestry Development Plan in 2005 after formulating the strategy and negotiating funding in 2004. The goal was to match with forest sector activities the national poverty reduction strategy and other development plans. In 2003, Bolaños promoted the continuity of donor investment for forest projects under a new institution called the Office of Sustainable Forestry Promotion and Investment.

Clearly international development actors influenced the direction of Nicaragua's recent forest development. The following discussion traces the global solidification of development roles among key international actors. It begins with a general look at international aid and then moves specifically into the topic of sustainable forestry. While there are many important actors in international development, the World Bank is arguably the most powerful. The following discussion focuses largely on the bank because what it does reverberates around the world. Trends within the bank are linked to efforts in Nicaragua.

THE WORLD BANK AND THE ENVIRONMENT

The World Bank was the first multilateral development agency to recognize the importance of environmental factors in lending and to address environmental criteria in project evaluation (Le Prestre 1995), possibly because it was so often the target of criticism by environmentalists. The bank's first environmental advisor was hired in 1969 and an Office of Environmental Affairs was established in 1971, but environmental policy developed slowly until the 1980s. Operational checklists from the environmental office were initially considered optional. Environmental risks were generally justified as long as the economic benefits of the project were clear. Yet, by the 1980s, it became increasingly obvious that projects, especially those connected with dams, rangeland development, and forests, were failing for environmental reasons, including lack of attention to ecological conditions. The failure of high profile projects heightened environmentalists' criticisms of the bank. NGOs effectively targeted the U.S. Congress and European parliaments to pressure for policy change (Thorne 2004), which demonstrates that multiple scales and sectors, including nongovernmental agencies, may leverage policy in a global, quasi-state institution. The World Bank is dependent on finance from individual countries and, therefore, must read and respond to donor moods (Horta 2000).

Since admitting in the 1980s that the policies were not sufficient to avoid environmental damage, revision of environmental branches was rapid (Le Prestre 1995). In the World Bank, there were just five environmental specialists in the mid-1980s (Wade 1997). A decade later, there were three hundred employees and a vice-presidency for environmentally sustainable development. During this period, the environmental field

was the fastest growing field of bank operations. With 1987 reforms, the bank made commitments to changes in both projects and policy. At the project level, environmental criteria were included during approval processes. Policy change was more difficult to implement, but technical units for environmental programs were developed globally, although critics charged that negative repercussions from loans generally continued.

While environmental impact assessments were resisted in the 1970s and 1980s because they were seen as costly and time-consuming, they were largely utilized by the 1990s (Le Prestre 1995). Originally, there was concern that they would overtax staff resources and delay project preparation and appraisal. It was also thought that the governments in developing countries lacked the legal, scientific, and administrative capacity to write valuable assessments. However, bilateral lending institutions, such as the USAID and its Canadian counterpart CIDA, adopted impact assessments and were teaching borrowers about environmental concerns. Again, the bank was influenced by activities at a smaller scale. Engineers within and outside the bank were also increasingly using environmental assessments in technical evaluations and considered them to improve their professional abilities and status. Although hesitancy continued in bank administration, the use of environmental assessments was widely implemented.

Environmental changes created a new area of growth for the World Bank. Environmental assessments became a major area of external expertise and justified foreign consultants training national scientists and engineers. I think that the impact assessment has largely become a political instrument. The involvement of different groups in the process serves to garner support for the project and define solutions that are broadly acceptable. Le Prestre (1995: 92) notes that while the minimization of

environmental damage through the impact assessment process is important, “Their primary functions are to reduce political and economic liabilities and build local constituencies. Their technical merits are secondary to these functions.”

In the early 1990s, the bank urged implementation of National Environmental Action Plans (NEAPs), which had the dual benefits of identifying environmental problems in recipient countries and defining new lending areas. Nevertheless, NEAPs have been criticized for being produced in an assembly line fashion according to a technocentrist and reformist blueprint. Bassett and Koli Bi (2000: 69) state, “As a type of green conditionality that is imposed on poor Third World countries seeking assistance from the World Bank, NEAPs are inextricably linked to the development industry and networks of power.”

In the 1990s, the World Bank noted a lack of coordination among donors. In weak environments, the bank believed, donors may run amok. They may compete to “plant their flag” and demonstrate visible results (World Bank 1998: 105). This discouraged important partnerships and impeded cooperation on long-term or systemic transformations. Donor agencies “saw themselves as being primarily in the business of dishing out money” (World Bank 1998: 23). The bank felt pressure to dole out resources rapidly in order to assure a replenishment of funds from donor countries, in spite of infrastructural and institutional problems limiting the quick absorbability of large amounts of funds in developing countries (Horta 2000).

Faced with low implementation capacity and pressure to ‘move the money,’ aid agencies have a long history of attempting to ‘cocoon’ their projects using free-standing technical assistance, independent project implementation units, and foreign experts—rather than trying to improve the institutional environment (World Bank 1998: 22).

Although the World Bank is owned by more than 180 member states, its financial strength rests on the contributions of the wealthiest, namely the Group of Seven Industrialized (G7) countries. It uses the collateral from these members to borrowing capital from the global bond market at advantageous interest rates (Horta 2000). Money is then lent to needy countries. Recipients are required to spend a portion of the loans to procure goods and services from firms in creditor countries (e.g., United States, Japan, Germany, France, and the United Kingdom) (Goldman 2004). When developing countries make payments (with interest), there is a net capital transfer to industrialized nations. This is a key factor behind my insistence that development funding is not always charitable, as most donors generally claim.

In spite of the rhetoric of sustainable development, financing remains a goal unto itself (Najam 2002). A crisis of legitimacy builds from growing doubt if funds were spent efficiently and appropriately. Gaps continued between rich and poor nations and little poverty alleviation occurred. I agree with Najam that a type of disjuncture ensues because international financial institutions operate on a different scale from the problem. While donors and development banks may be able to disburse amounts in the range of a million dollars, they are disinterested in projects that require economic resources in the thousands of dollars, which is a much more realistic budget for many projects in developing countries. Najam believes that the intuitions that are most effective at raising or leveraging massive amounts of funds are least able to scale down work at an appropriate scale of development. Although the solution would seem to me to be the inclusion of intermediary institutions, such as local and national NGOs, large international financial institutions are often inaccessible to these groups. The problem is essentially mismatched

scales and institutional capacities. Meanwhile, the tendency towards big grants can be disruptive.

One threat to the long-term sustainability of local organizations...is the availability of large quantities of funds from external authorities that appear to be 'easy money.' These can undercut the capabilities of a local organization to sustain itself over time (Ostrom 1995: 41).

Problems stem from the fact that the institutions that finance sustainable development are gauged predominately by financial criteria (Najam 2002). The World Bank points out that it is a bank. The highlighted statistic is the amount of "dollars spent." Meanwhile, the bank's rates of recovery would make nearly any financial institution envious.

Today, while some institutions in the World Bank group are not as likely to finance environmentally high-risk projects due to decades of criticism, other branches continue to do so (Griffiths 2002). During the last decade, the International Bank for Reconstruction and Development (IBRD) and the Association for International Development (IDA) of the World Bank group have moved in the direction of poverty reduction, health, and social development. At the same time, the International Finance Corporation (FCI), the bank's private sector branch, continues to help with large infrastructure projects and resource extraction. Mining, oil projects, and industrial agribusiness are indirectly assisted by the Multilateral Organization of Investment Guarantee (OMGI-MIGA), another arm of the same banking structure.

The sum of money allocated through international financial institutions is vast, which gives agencies, such as the World Bank, considerable power over international policy. Foreign aid is frequently conditional on the adoption of particular reforms (World Bank 1998). Conditionality for policy reform has three objectives (Seymour and Dubash

2000). It can be used to induce change when a borrower does not want to undertake reform. It can serve to keep the borrower committed to reforms already initiated with the threat to withdraw aid if transition does not continue. Agreements with conditions can also signal to other donors and investors that reform under a credible policy program is in place. Nevertheless, there are limitations to the use of conditions. Conditionality is essentially a short-term measure because it lapses once the funds have been disbursed. Moreover, donors have incentives to keep lending and so they seldom declare a borrower out of compliance. Stopped funding could create an economic crisis, during which time the borrower is likely to default on the loans already distributed.

Imposed reform or structural adjustment through conditional lending is a contentious issue and accounts for much of the criticism of bank policies. This is partially due to a legacy of using structural adjustment to force economic policy change, such as the reduction of social service spending to stimulate the balance-of-payments. If governments are not committed to the reforms imposed by donors, policy transitions are less likely to be successful. Tying funds to particular environmental policy reforms is sometimes justified because it can raise the profile of forestry issues and force reforms that cause setbacks for actors with vested interests in unsustainable logging. Seymour and Dubash (2000) believe that adjustment lending provides an important opportunity to mainstream the bank's social and environmental goals. The difficulty, they believe, is getting the conditions correct and effectively timing reforms.

I strongly agree with Horta (2000) that the bank's role has been fundamentally strengthened by its adoption of the environmental agenda as its own. From broadly being the world's largest development agency, the bank has also transformed itself to become

the main financier of projects aimed at the environment and biodiversity protection. Their approach depoliticizes issues and reconstructs them as technical problems that can be solved with technical solutions, which the bank is able to provide. In this way, one global institution, and its preferred allies and partners, provides both the money and the knowledge to advance the sustainable development agenda as they define it. Taking on environmental issues, the bank was able to disarm or absorb many of its most powerful critics. Goldman (2004: 57; emphasis in original) states, “Today the Bank finds itself in the enviable position of having an expanding loan portfolio *and* a globally adopted environmental agenda...the Bank has transformed an ‘anti-development’ environmentalist agenda into one that works in its favor.” The on-going scarcity of “bankable” projects was entirely eliminated with this new realm of loans (Rich 1994).

I propose that many World Bank projects are hastily developed in spite of environmental and social impact assessments because of the rapid appraisal methods used. Goldman (2004) sees these methods as fundamentally “extractive” because outsiders glean particular sets of data in cost effective methods with little room for analysis and processing in the field. Researchers are armed with a limited set of questions that they are paid to address. Data collection seldom goes beyond factors defined on a standardized list. In order to reach scientific and commercial goals, the bank has traditionally looked for projects and problems to which existing techniques and tools could be applied (Le Prestre 1995).

By the time local populations begin to understand the significance and goals of proposed projects, stakeholders have already been defined, the project is financed, and government agencies have been handed oversight responsibilities (author’s fieldnotes). In

consultations, the impacted populations are finally able to speak, Goldman (2004: 70) believes, “but mostly through the over-determined technologies of the development world, and not as decision makers able to control the trajectory of these powerful capital investments.”

I think it is necessary to address the gap between the stated environmental goals of large development banks and their actual programs. Given the size of these institutions, they are slow to change. At least one researcher has suggested that the World Bank may perform better than some other multilateral development banks on environmental issues (Gutner 2002). Yet, policy change at the bank has not been sufficient to appease many critics. While NGOs, such as the World Resources Institute, have justified their working relationship with the bank as an attempt to influence it from the inside, Bruce (1994: 162) states:

Institutions like the Bank often already had more information on how they should change that they could digest, much of it generated by their own staffs. The problem was not lack of information, but the absence of institutional incentive to use it and act accordingly.

Bruce charges that the attempts by outside NGOs to appear balanced in their assessments, and therefore dilute their criticisms, made it more difficult for critics within the bank to promote change in support of stricter environmental standards. He charges that staff reports were sometimes more aggressively critical than external ones. While other development actors, such as NGOs, weakened their assessments to not offend the bank, this had the unintended consequence of undermining internal critiques.

Since the 1990s, the World Bank used its support for the Global Environmental Facility (GEF) to demonstrate commitment to the environment. GEF is co-administered by the bank, the UNDP, and the UNEP. GEF provides grants and concession funds to

countries eligible for World Bank assistance to support the additional costs of providing global environmental benefits. Support is provided in the areas of climate change, biological diversity, international waters, and depletion of the ozone layer. These areas reflect what northern constituencies perceive to be the greatest global environmental problems (Horta 2000).

GEF funds have been used to leverage additional World Bank, bilateral, and host country co-financing. International cooperation on transboundary environmental problems also increased. However, core problems within GEF projects included uncertain financial sustainability and insufficient mainstreaming with broad social and economic goals (Campbell and Martin 2000).

The World Bank has been lending to forest sector initiatives since 1949. Early programs were largely industrial forestry projects, which reflected the perceived role of forests and the general approach to development in that period. Most projects were based on simple institutional arrangements consisting of one agency, one factory, and land with well-defined property rights. Projects were delineated in relatively small geographical areas. Emphasis was on forest industries, including sawmills, paper mills, and logging equipment. There was a high degree of integration and control was generally considered straightforward. Clear working rules focused on the maximum allowable cut, sustainable yield, and stumpage values. “Any other rule or intervening factor was assumed to be a disturbance in the system” (Operations Evaluation Department 1991: 6).

Tropical forest issues were addressed under a specific international institution for the first time when the United Nations Food and Agriculture Organization (FAO) started the Committee on Forest Development in the Tropics in 1967 (Humphreys 2004). In

1972, the FAO created the Committee on Forestry, whose mandate covered all forest types and not merely the tropics. With small budgetary allotments until the mid-eighties, these committees mainly oversaw the exchange of technical information on the development of forests. It was not until the late 1970s, during the negotiations over a tropical timber commodity agreement, that environmental NGOs challenged the technical and developmental forestry framework put forth by FAO and argued for forest conservation as an element of forest development. States eventually agreed to include a clause in the 1983 International Tropical Timber Agreement advancing the sustainable utilization and conservation of tropical forests and their genetic resources.

In a 1978 World Bank policy paper, the first forestry policy issued by the bank, there was an increase in social and environmental components in projects (World Bank 1978), although requirements were still poor by today's standards. These projects were found to be harder and more complex to implement than industrial models. According to a report by the bank's Operations Evaluation Department (1991: x), "Projects of this kind tend to accentuate intrinsic sociopolitical and institutional weaknesses...Some projects, for example, have increased the pressure to change traditional systems of property rights." Earlier modes of development tended to fall within traditional sectoral boundaries, such as forestry, industry, or agriculture, and were institutionally simpler. In later efforts, intersectoral linkages were needed to address problems that extended beyond the boundaries of individual forestry projects. Objectives broadened from economic growth to also include income distribution and sustainability.

Sustainable development solutions were beyond the World Bank's traditional domain and outside of areas in which it had a comparative advantage. Natural forests had

previously been considered inefficient because of low rates of production. It was often recommended that they be replaced with fast-growing plantations. Shifts in thinking about forest management now made these previous norms unacceptable. Initially, unsatisfactory performance was documented in a high number of natural forest management cases. While these projects continued to increase, results were considered less satisfactory than in industrial forestry projects. Donors appeared to not place enough priority on forestry institutions or recognize strain that the projects put on existing institutions. Property conflict, expanding governmental organizations, and new roles in the public and private sector created problems.

The Tropical Forestry Action Plan (TFAP) was a multi-agency program in the 1980s, and was conceived by the World Bank, UNDP, FAO, and World Resources Institute, a Washington-based NGO (Bruce 1994). TFAP was intended to mobilize eight billion dollars from aid agencies over a five-year period to alleviate pressures creating deforestation in developing countries. Nonetheless, TFAP was strongly criticized because it was largely prepared behind closed doors in Washington, New York, and Rome. It involved insufficient participation from actors in developing countries. Some also criticized the fact that the World Bank had much to gain from TFAP recommendations, including a major increase in its forestry lending portfolio (Bruce 1994).

The controversial TFAP did not result in action. First, there were power struggles between the bank and other key actors. Secondly, many doubted that the plan as written would promote conservation. The TFAP appeared to justify increased investment in the forest sector without challenging the forest management regimes that had been documented to create rapid deforestation (Seymour and Dubash 2000).

By 1991, the World Bank had lent more than two billion dollars for forestry. After the failure of TFAP, the bank needed to demonstrate progress in sustainable forest management. It identified lack of institutional capacity as the main impediment to long-term forest management (Seymour and Dubash 2000). There was growing consensus that funding should go to programs instead of projects (Operations Evaluation Department 1991). Donor agencies needed to commit to assistance for a longer period of time.

After 1990, there were important policy shifts in the World Bank (Operations Evaluation Department 1991). First, Latin American tropical moist forests moved up on the agenda. Between 1949 and 1990, only six percent of bank lending in the forest sector went to Latin America. Tropical forests also received greater attention in the 1990s partially due to international conventions, such as the Convention on Biological Diversity and the Climate Change Convention. Second, the bank began to recognize the importance of property rights. Third, the bank began to direct more energy towards establishing local level institutional arrangements.

Until the 1990s, World Bank environmental programs often did not incorporate NGOs and the private sector. The bank sought partnerships with NGOs and the private sector in the 1994 Forest Market Transformation Initiative (now Forest Trends), and the 1998 initiative called the Alliance for Forest Conservation and Sustainable Use, with the WWF (Campbell and Martin 2000). The alliance had a target of five million hectares of international certified sustainable forest management. While this was considered a pioneering effort to link forest sustainability to better logging practices and long-term economic support, criticism from environmentalists increased because of the simultaneous reversal of a 1991 World Bank ban on financing logging in natural forests.

The bank reversed this ban because they felt that management could reduce poverty in forest dwelling groups (Tarrifa 2003).

The World Bank continued to be criticized for supporting unsustainable forest policies. Criticisms broadened in the 1990s to include issues such as participation, the role of women, indigenous knowledge, benefit-sharing, and land tenure security (Humphreys 2004). While forest sector lending accounted for only two percent of the bank's portfolio in the late 1990s, an official stated that it contributed "ninety-eight percent of the headache" (as quoted in Seymour and Dubash 2000: 11).

Controversy surrounded policies that had direct and indirect impacts on the forests. At times, natural forest was destroyed to plant non-native, fast-growing species. Direct impacts also included the financing of large infrastructure projects, such as road building or dam construction, which necessitated deforestation. Indirect negative effects emerged from stabilization and structural adjustment (World Bank 1994; Seymour and Dubash 2000). When state budgets were streamlined, staff and funds for forest protection declined. Export incentives often increased extraction while a corresponding set of safeguards for minimizing environmental costs was lacking. Macroeconomic policies changed incentives, which led to the underpricing and depletion of natural resources in some countries. As one example, energy pricing reforms encouraged deforestation because fuelwood was more affordable than kerosene.

Until the 1990s, World Bank forestry projects addressed environment and equity concerns indirectly. It was assumed that increased rent capture would lead to greater reinvestment for poverty alleviation and that the increased value of standing timber would provide incentives for less wasteful logging practices and improved protection

against encroachment (Seymour and Dubash 2000). Several NGO critics of the bank, including the Fifty Years is Enough Coalition, charged that direct attention to poverty alleviation, participation, and resource access was necessary. Pressure to support conservation zones, as in protected areas, also mounted from more traditional environmental NGOs.

In the midst of reforms in the 1990s, the World Bank claimed to have difficulty assessing policies because forestry projects take a long time to mature and the institutions in the sector were also extremely slow to develop. While activities would normally be reviewed regularly and assessments made every couple of years, it was often hard to judge the results of forestry projects in the short term (Operations Evaluation Department 1991). Although there was recognition of the need for attention to connections between forest policy and poverty, projects were still largely industrial. In 1991, a World Bank report stated, “The Bank’s first priority in the forest sector is to help use the sector’s resources in an effective attack on poverty” (Operations Evaluation Department 1991: 49). However, a later review by Seymour and Dubash (2000: 17) found that the bank’s policy prescriptions still attempted “to ameliorate both equity and environmental concerns by improving the efficiency of industrial logging.”

While international donors claim to have “mainstreamed” ecological issues so that they are a standard component of economic reforms and wider development initiatives, attempts at blending have not been entirely successful (Campbell and Martin 2000). Clearly, forestry and biodiversity issues are discussed more in country strategies, but other economic and social development objectives continue to have priority. In many cases, this not only reflects the philosophy of the donors, but also of the recipient

governments. Existing funding for forestry programs will not offset benefits forgone from wholesale logging or conversion of forests to other land uses, such as agriculture. The World Bank's 1991 ban on direct financing of logging within natural forests proved to be a mistake in their minds because of the lost opportunities to finance forestry development outside of protected areas. The most valuable commodity from forests currently is the lumber. The bank's linking of conservation with effective income streams, such as those from sustainable logging, led to a reversal of the 1991 ban. This policy shift has been paired with the bank's promotion of international certification programs incorporating social and ecological criteria and community forestry projects that include forest extraction.

THE WORLD WILDLIFE FUND AND OTHER NGOS

In the first two decades after its initiation in Switzerland in 1961, World Wildlife Fund (WWF) developed slowly (Chapin 2004). In the 1980s, the organization began to grow more quickly. Today, WWF is the world's largest private international conservation organization with many affiliate and associate organizations. International branches employ thousands of people in more than one hundred countries around the world. WWF-International now goes by World Wide Fund for Nature, but the Canadian and U.S. branches have kept the name of World Wildlife Fund. The name in Spanish, used by Latin American branches, is *Fondo Mundial para la Naturaleza*, which roughly translates as World Nature Fund. All branches use the acronym WWF and the panda symbol.

The forest models that WWF supports have risen to ascendancy. WWF was a major actor in the promotion of Integrated Conservation with Development Programs in the 1980s and 1990s (Larson et al. 1998), helped to initiate the Forest Stewardship

Council in the early 1990s, and has been a key player in the transition from conventional to certified forestry (Cashore 2002). WWF and World Conservation Union (IUCN) support for biological corridors bolstered the rapid increase in their popularity in recent years (Simberloff et al. 1992). WWF is tightly involved with international negotiations on the conservation status and trade of big-leaf mahogany. In addition, WWF is strongly linked to media outlets. WWF Press publishes influential literature on forest and ecosystem management.

Large NGOs currently contribute twice as much for conservation projects as the GEF, making NGOs the biggest investors in conservation (Khare and Bray 2004). The lack of government funds for forest conservation allows for increased private and NGO control. Without state consensus on legally-binding forestry mandates, prominent “public-private partnerships” cede areas previously covered under public governance to the private sector.

Chapin (2004: 22) calls the three largest nonprofit conservation organizations, WWF, Conservation International (CI), and The Nature Conservancy (TNC), “the Big Three.” Two of these groups, WWF and TNC, are heavily active in indigenous forest projects in Nicaragua. Chapin (2004) reports that since 1990, there has been a reduction in the amount of money available for conservation programs, yet the money for the Big Three increased in both relative and absolute terms over this same period. In 1998, these three organizations invested approximately \$240 million in conservation in developing countries. By 2002, this amount had grown to nearly \$490 million. While two decades ago, private foundations and individuals provided the majority of funding for WWF, TNC, and CI, today their monies also originate from private corporations, such as

Chevron, Texaco, Exxon, Mobil, Shell, Weyerhaeuser, Monsanto, Dow Chemical, and Duke Energy.

According to Chapin (2004), large organizations have been able to monopolize foundation conservation funding due to the large-scale conservation approaches that they have developed since the mid- to late 1990s. These organizations argue that their techniques are more cost-effective and that only they have the capacity to manage such vast schemes. Nevertheless, Chapin charges that ecological concepts as employed by the organizations are slick marketing tools. Environmental NGO programs do have a scientific base, but the focus of their use is to motivate and engage support for conservation initiatives that generate support for these same groups.

Conservation groups have increased funding from bilateral and multilateral sources. When the WWF began accepting funding from USAID in the early 1980s, they made sure that USAID contributed less than fifty percent of the budget for any particular project. Over time, however, this rule was increasingly broken and eventually some projects were funded eighty to ninety percent by USAID. Other large NGOs followed suit with similar governmental contributions. Today, approximately twenty-two percent of WWF global income comes from governments and their assistance agencies (Chapin 2004). Between 1990 and 2001, USAID provided approximately \$270 million for conservation activities to NGOs, universities, and private institutions. WWF received about forty-five percent of USAID monies allocated to NGOs in this period.

In an environment of intense competition for limited funds, politicking, maneuvering, and professional rivalry among key actors have reached unprecedented levels (Blaikie and Jeanrenaud 1997; Chapin 2004). In the midst of these rivalries, there

is unprecedented networking among certain powerful groups, such as the World Bank, USAID, and WWF. These networks were evident in my Nicaraguan case studies.

Large-scale conservation models are argued to establish a mosaic of ecosystems with different ecological characteristics and human uses and to have great potential to protect biodiversity and improve local living standards. In the 1990s, several major international conservation organizations started to “scale up” their approaches to environmental and biodiversity protection (Miller 1996; Chapin 2004). Different names have been utilized to depict the entities covered in this shift to larger scales, such as ecoregion or bioregion. Bioregions are seen to contain several nested ecosystems and may incorporate farming, forestry, fisheries and other human uses with biodiversity conservation (Miller 1996). Large scale approaches tend to be holistic and integrate social, economic, and ecological factors while planning projects, such as the Mesoamerican Biological Corridor (MBC). Nevertheless, there is the potential for tradeoffs required during project implementation between these three supposedly interdependent “legs” of sustainable development.

There are institutional, ecological, and economic justifications for scaling up. It is possible to achieve an economy of scale for production and reduce replication and redundancy in management activities. In ecological terms, the entire world system of interlinked ecosystems is under increasing pressure (Chapin 2004). A scattershot approach based on certain species or spatial pockets may not protect the vast range of areas and organisms at risk. With fragmentation as a result of agricultural expansion, road development, urbanization, and natural resource extraction, large-scale approaches can safeguard connections between smaller protected areas to enable the movement and

dispersal of flora and fauna. Geographic Information Systems (GIS) and satellite imagery reinforce large-scale planning approaches because they demonstrate interconnectivity across vast areas.

Large scale models often recognize the contribution of inhabited landscapes to biodiversity conservation so less land is set aside in access-restricted protected areas. This implies fewer economic opportunity costs since a wider range of economic or productive activities are allowed (Miller et al. 2001). It is also argued that large-scale strategies can do more with less money and are efficient to administer. Large-scale conservation models are highly visible and, therefore, attract donors (Blaikie and Jeanrenaud 1997). Donor pressure to spend aid funds is relieved as the budgets of large-scale projects can absorb large grants, as occurred with the MBC. With shared input from numerous donors, projects are considered “bankable,” more certain to move forward, and less risky. Domestic compliance with conditions attached to funding is likely since the monies in play are substantial. Meanwhile, state officials in developing countries are attracted to large projects because of the obvious opportunities in terms of employment, patronage relationships, and other direct and indirect gains.

Although one of many groups with large-scale approach, I use the example of the WWF because of their substantial influence in Nicaragua. In the 1990s, WWF broadened its scope to focus on approximately two hundred outstanding ecoregions selected globally. An ecoregion is a large area of land or water that contains a geographically distinct assemblage of natural communities that share a large majority of their species, ecological dynamics, and environmental conditions, and interact ecologically in ways that

are critical for their long-term persistence (Dinerstein et al. 2000). WWF's ecoregion approach is clearly based in scale arguments. WWF reports that this interest arose:

From the recognition that a larger scale is necessary to achieve conservation results that are ecologically viable...a larger scale is also necessary to address broader social, economic, and policy factors that are essential to long-term success (Larson et al. 1998: 43).

“By encouraging ecoregional thinking, there is a greater chance that large-scale ecological processes will be recognized and maintained,” the WWF (2004b) website claims. Four of WWF's principles of Ecoregion Conservation address scale directly. “Ecoregions are the appropriate geographical unit for setting conservation goals; they represent an ambitious and visionary scale necessary for biodiversity conservation,” states WWF's (2004b) on-line policy statement, adding that threat analysis is an essential filter for figuring out the scale at which institutions should act. Another principle stresses that working at multiple scales and practicing adaptive management with feedback from various levels are critical to rapid success. This is an important point. Although WWF advocates a large-scale approach, they are committed to working at various scales.

Acknowledging the interrelation between ecological and political scales, WWF's (2004a) Ecosystem Principles note that institutional development is necessary to strengthen advocacy at multiple scales so that the organization and its partners are able to take advantage of political and publicity opportunities. WWF and its partners strategically leverage the efforts of others to advance protection of global biodiversity (Larson et al. 1998). This approach requires aggressive networking at various scales to achieve coordination among numerous stakeholders to advance region-wide initiatives. Because ecoregions often cross borders, transnational cooperation is essential.

It is sometimes recognized that the large-scale approach requires a balancing of the scales to maintain biotic viability in management programs, although in reality tradeoffs often occur. While it is important to identify the linkages and interdependencies at a large-scale, projects and programs are often directed at smaller ecosystems, such as stream catchments, valleys, or individual patches of forest (Miller 1996). The goal is not intended to be uniformly large initiatives, although this is sometimes the appearance, but rather using large-scale analysis to identify priorities at intermediate and even small scales. This is the role of WWF's Global 200, a set of priority ecosystems and habitats that, in conjunction, represent a broad array of the Earth's terrestrial and aquatic biodiversity. The goal was to balance areas of ecological scarcity and value with those that were likely to be most threatened over the next decades. While recognizing the limitations of predicting ecological change, large-scale planners increasingly encourage the incorporation of time into planning. Miller (1996: 1) states, "Management programs must anticipate nature's timing of events as well as the amount of time society needs to adapt to new information, technology, and global change." The large-scale approach is ultimately designed to be a flexible, integrative, and holistic method of planning for natural resource conservation and use.

In large-scale approaches, there can often be conflict or competition between institutions or goals. Institutional integration and international cooperation are both important for management at larger scales, but are not easy to achieve. Large-scale conservation methodologies pinpoint priority biodiversity conservation zones and appropriate human development areas within regional plans, yet the priorities defined by

transnational organizations may conflict with local livelihood strategies. Further, the tradeoffs promoted may not match national value systems and policy initiatives.

The large-scale approach requires linkages between social and ecological goals because ecoregions include heavily inhabited areas. For example, WWF highlights poverty reduction as a major environmental concern, which fits with the policies of one of its major partners in forestry development, the World Bank. The grouping of biodiversity conservation goals with poverty reduction and human development has been criticized by some ecologists and conservation biologists.

In 2004, ecologist Archie Carr III discussed his mounting concerns over the MBC, a project that he helped to invent. When Carr worked with funds from USAID in the early 1990s to develop and promote the original Central American corridor idea, called the *Paseo Pantera*, it was considered an innovation in wildlife conservation that was uniquely suited to the elongated geography of the region. Today, the biological corridor has been expanded to address social problems from education to gender equity. Carr (2004: 36) states that the MBC has “gravitated away from parks as wildlife refuges, and toward something like welfare nuclei: designated spaces, perhaps with trees, where the needs of humans could be attended to.” Carr believes that the corridor concept in the MBC has become a euphemism for broad social development.

Carr (2004) discusses an interesting double standard in international conservation. European donors’ support for the MBC is contingent on poverty alleviation. Conservation goals are overshadowed by the reconstruction efforts for the war-torn nations. However, the large-scale corridor project covering Europe, entitled Natura 2000, focuses specifically on species protection and habitat protection, not social programs. The

European Union states are working aggressively to recover the natural integrity of their regional landscape. Donors that insist on the weakening of conservation mandates in the MBC in order to focus on economic development reject the same model for their own region. European expertise on corridor design, park strengthening, and ecological monitoring has not been prioritized for transferal to Central America. Carr believes the European experience with restoration ecology would be relevant in Central American landscapes.

Carr (2004) argues that social development in Central America is clearly necessary, but warns that the goals of rural development and biodiversity conservation are distinct and that some programs should remain separate. With the millions of dollars that have already been transferred to the MBC, the species and habitats of the region are not protected. Carr argues that if conservation is postponed until the standards of living have risen significantly, there will be little biodiversity remaining to protect. He suggests that large-scale, integrated socio-ecological programs are overly focused on social concerns and neglect biodiversity.

Although conservation projects have sometimes been criticized for not protecting biodiversity sufficiently, some theorists also believe that they are inadequate in advancing social goals. Brosius and Russell (2003) have reservations about the large-scale development efforts because they believe that the rise in the regional approach has risen out of a loss of faith in community-based conservation. They believe that the social analysis based upon community-based projects was often flawed. Too little attention was paid to extra-local forces, intra-village variations, and power and access differentials; yet conservation practitioners widely blamed communities, which influenced a shift away

from small-scale projects. Brosius and Russell suggest that if development practitioners could not generate accurate social data at the local scale, they would be even less likely to do so at a regional scale. I agree that rapid, formalistic documentation in vast areas cannot replace long-term, in-depth ethnography at smaller-scales.

Although participation is argued to be important in most large-scale planning models, the widening of scale has been accompanied by an increase in “environmental managerialism” (*sensu* Escobar 1995). Technical and institutional solutions are promoted. Transnational conservation sponsors often take “apolitical” stances that allow ruling elite to avoid structural political or economic change that would challenge their hegemony. Meanwhile, I think large-scale approaches may privilege transnational institutions at the expense of grassroots or national conservation initiatives. Brosius and Russell (2003: 50) state:

Apparently designed to advance a conservation agenda, global conservation organizations, treaties on conservation, and international research efforts, in fact, often obstruct meaningful change through the creation of unwieldy projects aimed at top-down environmental management that serve mainly to amplify state or NGO power.

In my evaluation, there also are social justice concerns relating to large-scale conservation geographies. By extending buffer areas, corridors, and other types of conservation areas, state control may be extended to areas where it has a poor record of respecting local rights and state-society relations are poor (Brosius and Russell 2003), including communal lands claimed by indigenous populations. The trend to widen the conservation reach of the state counters devolution of resource governance. The argument for local power in much resource management literature is based on the premise that

when people lack control over resources, they tend to not take care of them (Peluso 1999).

Since they are often based on standardized ecological principles, large-scale conservation models have been criticized for lacking sensitivity to local social and cultural circumstances. Another concern is that large-scale models reinforce the hegemony of a limited number of conservation organizations and international donors, who argue that they are only the ones with capacity to administer projects of magnitude (Chapin 2004).

There is a concern over a trend towards increasing authoritarianism in conservation (Brechin et al. 2002; Wilshusen et al. 2002; Chapin 2004). Ribot (2004: 53) warns that the landscape approach that is now popular among donors and NGOs needs to be adopted with caution. At times, it may be used as an excuse to re-centralize power or maintain control of natural resources at higher levels. Large-scale initiatives will be problematic if they attempt to incorporate vast regions without gaining local support, or only have select representation from small pockets within a larger area, as occurs with the ABC and REPROMAB cases studies discussed in Chapters Six and Seven. External organizations may see large-scale initiatives as a scientific planning exercise. If they do not involve local populations in the definition of protected areas, multi-use zones, corridors, and other categories, work at this larger scale may confront conflicts with local populations. These concerns are highly relevant to later discussions involving the MBC. Larger projects focused on ecological connectivity need to gain local support or they may forfeit some landscape linkages.

In most development programs, landscapes are broken down into units in a process of national planning guided by aid institutions, conservation agencies, and international agreements and pacts. Instead of establishing a range of gradients among the large, intermediate, and small scales, international aid has tended to jump from small-scale community-based projects to large-scale or transnational models. Although major conservation projects argue that large-scale initiatives are cost-effective and efficient, considerable funding goes to workshops, seminars, fancy publications, glossy reports, consultant fees, international travel, and other expenses outside of local projects. Investing in the capacity development of local actors is often viewed as costly, but in my opinion it is inexpensive when compared to the operation budgets of national or transnational institutions.

The impact of domestic conservation groups may also be more efficient than international efforts based on findings of a Biodiversity Support Program report. Margoluis et al. (2000) found in a sample of twenty projects that those that involved international alliances had five times less success in conservation than national or local actors without international partners, in spite of the greater technical and financial resources held by transnational actors. Although the sample size is small, this report suggests that assumptions that large transnational networks are more efficient in addressing conservation goals may need to be questioned. The irony is that the research was funded by USAID, WWF, and other large-scale conservation actors.

GLOBAL FOREST GOVERNANCE

Sustainable development doctrines and policies often address rainforest environments and biodiversity (Taylor and Buttel 1992). There has been heated

international debate on the governance of forests for decades (Mankin 1998). The number of international accords and transnational organizations dealing with forestry has grown exponentially. Additional information on the global forest governance regime can be found in Tarasofsky and Downes (1999), Speth (2003), Humphreys (2004), and Najam et al. (2004). There has been global commitment to research and exchange of information, but forest policy and action to combat deforestation are both seriously lacking. This is partially because key actors in the global economy set the parameters for responding to environmental degradation. According to Humphreys (2004: 46-7), the international forest regime has been “colonized by neoliberal principles that support forest business and investment in forest areas.” Gulbrandsen (2004: 80) agrees that:

[E]conomic forest interests prevail throughout the non-binding forest agreements and there are hardly any restrictions on investment in forest areas. Thus, the forest regime arguably favors those with an interest in the commercial utilization of forests.

The promotion of increased markets for tropical timber and allegiance to the principles of free trade may contradict policies aimed at biodiversity protection and long-term sustainable forest management. The World Trade Organization (WTO) challenges environmental regulations if they hinder resource markets (Humphreys 2003). There is growing controversy over potential conflicts between free trade and timber certification or endangered species export restrictions.

I am critical of global lawmakers for continuing to assert that conservation and use of forests are compatible in spite of the inability in recent decades for the forest regime to place any limits on the commercialization of forest resources, reverse deforestation, or protect many endangered species or threatened habitats. Humphrey (2003) suggests that the soft, caveated, and inconclusive nature of regimes in

international forest governance make implementation and verification difficult and allow market forces to operate unfettered. He discusses how potentially negative consequences are masked with discourses focused on opportunities for prosperity and growth for those willing to compete.

In contradiction, some analysts argue that states have agreed on a number of principles to promote the sustainable use and conservation of forests. Although there are gaps, they believe that there are several important clauses in global accords that can contribute to better management of tropical forests in developing countries (Blundell and Gullison 2003). It is argued that states must proceed with caution because there are significant risks involved in the negotiation of new legal instruments (Tarasofsky 1999). First, negotiations will be lengthy and require financial and technical resources. This can take scarce funds from other activities. Second, with considerable divisions within the international community, the norms accepted may reflect the weakest common denominator. Third, any new instrument could undermine or contradict previous efforts or other instruments related to forest policy. It is important to understand the potential synergy between accords. Further, instruments have the dual challenges of creating effective mandates and providing tangible results with implementation. A crisis of credibility builds when agreements cannot be enforced.

Once approved, environmental accords continue to face severe challenges. Key actors may determine that it is not in their interest to comply and enforcement mechanisms of international treaties are generally weak. It may be hard for governments to encourage or coerce populations to accept and adopt new mandates if they threaten

local livelihoods. When a new instrument is adopted, there is a period before it enters into force. More time passes before effective implementation can be achieved.

In my analysis, these temporal constraints are directly linked to issues of scale. International environmental accords are large-scale solutions based on notions that environmental issues are best addressed at a global scale because of the transboundary implications from ecological deterioration and the premise that countries where destruction occurs should be influenced to improve their practices for the common good. However, pro-large-scale arguments promoting international conventions are weakened due to the limited advancement in forestry agreements and insufficient commitment to sustainable practices. Inefficiencies in global governance may even be exploited by governments unwilling to commit to logging restrictions or expensive environmental protection (Mankin 1998). According to Glastra (1999: 21), “The proliferation of overlapping international ‘talkshops,’ special commissions, working groups, official statements, and policy papers...could be a deliberate attempt to create confusion and provide excuses for inaction.”

Whether or not global forest governance is intentionally stalled, as I believe it may be at times, large-scale policy is limited in its ability to achieve rapid on-the-ground conservation results. Since international policy creation is time-consuming, many transnational actors support forest management projects in specific developing countries, which can be implemented more quickly. Projects focused on reducing tropical deforestation and protecting biodiversity will be addressed in the remainder of this chapter.

FOREST DEVELOPMENT AND CONSERVATION MODELS

The remaining sections of this chapter present six popular forest development and conservation models experimented with in Nicaragua. In some international contexts, particular models have worked; in others, they have not had the intended results. The roots of each model fit under the general rubric of integrated “conservation with development.” The models employed represent examples of two distinct shifts in donor preferences for sustainable development. The first trend is towards projects covering large spatial scales, such as ecoregions or transnational biological corridors. Large-scale conservation geographies are often transnational. They frequently consist of a mosaic landscape with areas of intense conservation and areas where sustainable human production is promoted. The second trend is commerce-based approaches that promote the governance of resources through the market, including the endorsement and governance of sustainable forestry certified lumber, ecotourism, pharmaceuticals, environmental services, or other extractable and saleable goods. These two trends are reinforced in international environmental agreements.

“Integrated Conservation with Development Programs” (ICDPs) are supposed to link biodiversity conservation to social and economic progress (Larson et al. 1998; Brandon 2001; Brown 2002; Chapin 2004). They became popular with many development institutions in the 1980s (Brandon 2001). Justifications for ICDPs include the poverty of populations living near high biodiversity areas or within protected area boundaries, population growth, and the high cost of enforcing environmental regulations if resident populations do not respect protected areas and directly benefit from

conservation initiatives. ICDPs build from the premise that protected areas in developing countries must address human development.

ICDPs generally involve a conservation core zone, where use is restricted, and buffer zones, where socioeconomic development is encouraged (Brandon 2001). As a protective band around park cores, buffer zones are supposed to extend conservation by increasing the area to provide ecosystem services and wildlife habitat. They are also expected to reduce negative human impacts, such as contamination from agricultural pesticides or wastewater, on the protected core area, and diminish human contact with wild predators. Sundberg (1998b, 2003a, 2003b) criticized the use of the buffer zone construct in Guatemala because outside conservation actors defined the location of these areas and determined which human uses were acceptable. These decisions were largely political as some groups were allowed to continue livelihood activities in buffer areas while others were excluded.

The focus of ICDP programs has changed substantially over recent decades. Early ICDPs tended to see people as a problem to be controlled in order to protect biodiversity. During initial ICDPs, local populations often remained alienated from the management of protected resources (Larson et al. 1998). This model came to be known as “fortress conservation” (Brown 2002), or protection by exclusion. Early ICDPs also saw people as a problem interfering with scientific agendas. In addition to the “fences and fines” approach of classic protected area models, early ICDP programs focused on alternative income-generating activities with the assumption that pressure would be taken off of protected areas because populations would leave behind livelihood activities deemed harmful to local ecosystems. However, many early interventions aimed at assisting local

populations by targeting broad development needs and programs were often not directly related to conservation (Larson et al. 1998).

A main advocate and organizer of ICDPs is the WWF. In 1985, WWF launched a Wildlands and Human Needs Program with an initial portfolio of twenty ICDPs (Larson et al. 1998). In 1989, the World Bank, WWF, and USAID sponsored a study called *People and Parks* to review ICDP strategies in fourteen countries and evaluate if they were cost-effective, sustainable, and replicable (Brandon 2001). There were three major shortcomings identified in the twenty-three ICDPs they covered in the study. First, ICDPs required significant investment and economic returns were not guaranteed. Second, because they were complex projects, and it took time to establish connections between conservation and development, ICDPs were often not appropriate in areas with immediate economic or ecological crises. Third, to be successful, ICDPs frequently required policy support beyond specific project implementation efforts. These problems were used to reformulate ICDP recommendations. In the early 1990s, a second generation of ICDPs attempted to integrate conservation and development more directly (Larson et al. 1998; Brown 2002), although results were mixed. There was focus on improving community skills, empowerment, and increased stakeholder participation. This generation of ICDPs coincided with a global trend toward community-based conservation projects (Brandon 2001). ICDPs soon became a global strategy for implementing biodiversity conservation. In the 1980s and 1990s, ICDPs received over half of all WWF funding (Larson et al. 1998; Brandon 2001). Nevertheless, in many areas, the community-based approach was often reported in project evaluations to be unsuccessful in providing direct benefits to local populations, who continued to use resource

unsustainably and threaten biodiversity. Some villages did not accept the agendas of ICDP donors and advocates. A study by Kremen et al. (1994) also suggested that ICDPs were ineffective in contributing to wildlife conservation. Only five out of thirty-six ICDPs they reviewed from more than twenty countries preserved natural resources and protected biodiversity. These results suggest that both the conservation and development components of the projects were lacking.

In the early 1990s, a second generation of ICDPs integrated conservation and human development more (Larson et al. 1998), although there were still compromises apparent in many cases. Project proposals discussed how local people should be treated as resource managers and their rights and responsibilities for management and sustainable use were stressed. However, an ICDP carried out by WWF, USAID, and other international actors in the early to mid-1990s in northeastern Nicaragua, in the area known as the Miskitu Cays, demonstrated that conservation organizations, donors, and state agencies sometimes continued to speak on the part of indigenous populations and restrict their decision making power even in resource projects that were supposed to involve co-management (Nietschmann 1997).

In many areas, neither of these two earlier ICDP approaches was successful in providing direct benefits to local populations in terms of providing alternatives for subsistence and commercial activities that were deemed incompatible with conservation goals. In the third and current generation, ICDPs began to focus on appropriate economic incentives to improve the standards of living for local populations while protecting biodiversity. Organizers advanced strategic tradeoffs between conservation and development and amongst various stakeholder groups (Brown 2002). The ICDP approach

now focuses on complementarities, as promoted through policies identified as “win-win” solutions. Advocates, such as WWF, believe that positive incentives created through market mechanisms will support conservation when economic value is correctly attributed to biodiversity, forest products, and land holdings. Neoliberal environmentalists seek to remove perverse incentives for ecological degradation that frequently exist in policies, institutions, and markets. Following this paradigm, many conservation actors have shifted from a nearly exclusive focus on protected areas to eco-friendly forest production (Gretzinger 2003).

The three ICDP generations closely approximate three different development paradigms presented earlier in Chapter One: paternalist, populist, and neoliberal (Blaikie 1994; Blaikie and Jeanrenaud 1997). Very broadly, paternalistic or classic conservation programs attempted to control local behavior based on a “scientific” mandate. With rising criticism, there was a drastic shift to partnerships with local populations. Populists romanticized the potential for projects to meet the needs of forest-dwelling inhabitants and assumed local populations would embrace conservation initiatives. When these programs did not have intended impacts, there was another fundamental shift. The latest group of ICDPs addresses the poverty of local populations through linkages with the global economy. Yet, Brandon (2001) suggests that third generation ICDPs are incorrectly built around the assumptions that win-win solutions can be readily found, effective economic incentives for conservation can be easily implemented, and that poverty reduction will directly lead to biodiversity protection.

ICDPs were originally attractive to donors using the populist or neoliberal framework because they contributed to three main goals in the sustainable development

agenda: biodiversity conservation, community participation in conservation, and economic development for the rural poor (Campbell and Martin 2000). Nevertheless, ICDPs' goals did not match their results in many locations. However, the blame was generally not placed on the ICDP concept. Yet, it was increasingly noted that the projects did not address the real threats and capacity constraints of conservation projects in the field. By the late 1990s, ICDPs were recommended only for areas where the greatest threats to biodiversity was the local people living in the vicinity of protected areas. In these cases, the inclusion of local populations in conservation schemes is increasingly standard. The focus has shifted from the conservationist tendencies of indigenous and traditional peoples and their utility as stakeholders in protected areas toward their potential to manage natural resources outside of official conservation zones as project partners, business owners, manufacturers, producers, tourist guides, or village foresters.

The earlier norm of core parks and buffer zones has become less popular. Some conservation programs have shifted up in scale away from individual protected area projects. Although this shift does not necessarily contradict the formation of national parks and protected areas, as they can make up one part of the larger conservation landscape, some studies have found that a focus on larger-scale initiatives has meant less attention to ICDPs (Khare and Bray 2004).

Five specific forest development models are utilized in the Nicaraguan study area: forest reserves, biological corridors, community sawmills, certified forests, and trade restrictions. Other market-based solutions, such as carbon markets and ecotourism, have been discussed in Nicaragua, and are initiating in the Pacific region. Since they had not initiated in the study area at the time of fieldwork, they are not included in this work.

Each of the aforementioned development models is expected to contribute to sustainable forest management.

Mankin (1998: 2) describes sustainable forest management (SFM) as:

Forest management that maintains the forest, its ecological functions, processes and overall structure, in healthy conditions, in perpetuity, and that is capable of producing a wide range of environmental, social and economic benefits to society without producing any irreversible consequences or losses to soil or water quality, to biological diversity (including genes, species, and ecosystems), or to unique areas and values.

SFM is a broadly utilized concept. Some theorists focus on human needs, while others are concerned with biological diversity and overall forest integrity. A more exact definition of SFM is beyond the scope of this work, but as used here I am referring to societal goods and services as well as ecological processes that are not directly linked to human use and well-being.

Forest Reserves

Protected areas around the world have become sites of intense struggle between conservation and production. There are two potentially opposing goals for protected areas. Some advocates believe that while human needs are important, biodiversity conservation should be separated from human development initiatives (Redford and Sanderson 2000; Carr 2004). The second view is that protected areas need to be integrated with social programs to form one managed human landscape. In the first view, resource use by indigenous populations is seen as an external threat to biodiversity conservation. In contrast, the second accentuates the fact that indigenous populations inhabit the majority of protected areas and zones of high biodiversity and, therefore, their needs must be addressed within management initiatives (Colchester 2000).

There are numerous types of protected areas with different goals and degrees of restriction for human use. Extractive reserves, the type treated as a case study later in this work, are particularly linked to markets. Extractive reserves have gained popularity in conservation circles because of the potential to conserve tropical forests while providing income to local populations (Ghimire and Pimbert 1997). However, some studies have suggested limitations related to instabilities in resource markets and negative consequences for local institutions and tenure regimes (Stanley 1991; Peluso 1995).

Salafsky and Wollenberg (2000) document a transition from a protected area model without linkages between livelihood production for local people and conservation to new models that integrate human needs and biodiversity. If local populations directly benefit from conservation, then they have an incentive to identify and act against internal and external threats to biodiversity. Protected area projects involving indigenous co-management have the potential to assist native peoples to gain international support for land and natural resources rights (Stevens 1997). Unfortunately, native populations are frequently not consulted prior to the creation of protected areas. Their exclusion can have negative consequences for their subsistence strategies and tenure claims. Protected areas often reflect the agendas of national and international interests (Ghimire and Pimbert 1997).

Forest reserves are just one sub-type of protected area recognized under the World Conservation Union (IUCN) categories, which are usually considered the international standard. The six core IUCN categories range from strict conservation for scientific research or wilderness to sustainable use of resources. The sixth category, which allows the greatest human use, was the last to be added (Ghimire and Pimbert 1997). This

category, the managed resource protected area, must have at least two thirds of its area remaining in a “natural” state.

The Alamikangban Caribbean Pine Genetic Reserve and Seed Bank, a case study in my research, is a rare melding of an extractive reserve with a process akin to bioprospecting. Bioprospecting is the exploration, screening, and extraction of commercially-viable genetic or biochemical resources (Ghimire and Pimbert 1997). Genetic reserves are not widespread and have specific attributes worth discussing. The general premise is that there is one or more species in the protected area worthy of *in situ* protection because either they are only found in this area or the genetic quality of the individuals here are superior to other samples from other areas where the same specimen can be found.

Biological Corridors: Linkages in the Landscape

Corridor projects range in scale from a hedgerow to a continent. Although corridors may be designed to be geographically large or small, these connectivity zones are often seen as a means to “network” benefits from discrete, individual protected areas. Two of the largest transnational initiatives are the Mesoamerican Biological Corridor (MBC), which includes Southern Mexico and seven Central American nations, and Natura 2000, which is located in Europe (Carr 2004). Natura 2000 covers fifteen percent of European Union states to date, but it is expected to transverse the entire European region in the future.

Habitat or wildlife corridors can be defined as swaths of natural or semi-natural vegetation embedded in a dissimilar surrounding environment that link larger blocks of habitat and are promoted to enhance or maintain the viability of specific wildlife

populations (Beier and Noss 1998). Biological, or dispersal corridors, are essentially the same as habitat corridors and protect genetic flow among species of flora and fauna. Other landscape linkages are green belts, greenways, hedgerows, and fencerows (Bennett 2003). Ranging in size, green belt and greenway vegetation buffers bodies of water or transportation infrastructure. Hedgerows and fencerows are micro-corridors, but they are often utilized by a wide range of species. Green belts, greenways, hedgerows, and fencerows may provide important habitat in heavily disturbed environments. Table 4 presents several corridor projects and their goals.

TABLE 4
A Sample of Corridor Projects
(Bennett 2003; Carr 2004)

Name	Countries	Main Goals
Pinhook Swamp Corridor	United States	To provide a natural link between a national forest and wildlife refuge
Maryland Greenways Network	United States	To provide wildlife habitat and human recreation zones; To protect water quality
Territorial System of Ecological Stability	Czech Republic	To provide linkages between natural areas in a national habitat network
North Westland Rainforest Corridor	New Zealand	To maintain the potential for bird movement between a series of forest reserves
Kimbale Forest Game Corridor	Uganda	To allow movement of large game animals between a national park and protected forest
Mesoamerican Biological Corridor	Southern Mexico and Central America	To protect key biodiversity sites; To link protected areas throughout the peninsula; To promote sustainable economic development
Natura 2000	European Union	To promote species and habitat protection; To recover the region's natural integrity by linking protected areas

While many corridor designs are simple and primarily involve restoring or protecting vegetation, some are technologically sophisticated, such as artificial underpasses to help animals move across barriers which could be roads and railways. As the landscape is perceived differently by each species, linkage requirements are distinct. It is not always possible or necessary for continuous habitat; birds or waterfowl move through discrete refuges (stepping stones) located some distance apart.

The corridors in my research link protected areas and priority biodiversity zones. Although they can be designed to be geographically large or small, these connectivity zones reduce fragmentation, which can indirectly “scale up” the benefits from discrete protected areas through natural networks. The isolated park model has often proven impractical and inefficient and so there are now proposals to reconnect protected areas to the larger landscape. If destruction occurs around a protected area, the biodiversity located within is still threatened, especially if the park was designed too small or has been encroached upon since its creation. Individual species in protected areas can become isolated, leading to a loss of gene flow. The chance of extinction is then increased. Climate change may exacerbate this pattern if transitions occur more quickly than species can evolve. With linked landscapes, animals may move through corridors to shift their geographic range and stay in a preferred habitat (Simberloff et al. 1992). If habitats are fragmented, this movement may be impaired and survival endangered.

Habitat corridors may provide safe movement through human inhabited landscapes, reduce territorial battles due to confinement, and improve diet from increasing potential food sources (Simberloff et al. 1992). Some species, such as wildcats or bears, need large home ranges. However, the ability of corridors to meet these needs

has not yet been widely documented. Corridors might lure animals into areas where they experience high mortality (Beier and Noss 1998).

General conclusions about the biological value of corridors are difficult due to species-specific requirements (Beier and Noss 1998). Although the number and rigor of studies addressing the use of corridors have increased, since each targeted species and landscape needs to be evaluated over time to determine potential benefits, it is hard for science to guide current policy. Our knowledge of habitat needs for many animal species is poor. Movement through human inhabited landscapes may depend on factors that have not been identified or documented.

According to Carr (2004: 36), “mission drift” occurred during the negotiation of some corridors, such as the transnational project in Central America. Corridors were first promoted by ecologists, but they are sometimes utilized as general regional development tools. The MBC has become a project for large-scale rural development and ecological land-use planning encompassing a wide range of production and conservation goals. Biodiversity conservation, habitat protection, and connectivity between protected areas now play a relatively minor role (Carr 2004). Many “corridor zones” in the MBC are actually territorial strips that have been assigned particular economic functions (Miller et al. 2001).

Urban, transportation, and energy corridors may have the same name as their biological counterparts, but, in fact, they can create barriers for the dispersal of flora and fauna. Interestingly, some of the same donors supporting the MBC have also funded the Puebla-Panama Plan (PPP), a regional development plan involving southern Mexico and

Central America.³³ The PPP includes a series of industrial and transportation corridors crossing the width and length of the isthmus. In my opinion, there has been surprisingly little discussion of the intersection of industrial or transportation corridors and their ecological counterparts, in spite of the fact that the connectivity of the latter is breached by the former when they cross. Demonstrating potential contradiction between PPP and MBC plans, proposed roads and transoceanic transportation canals in Nicaragua would run east to west, while the largest biological corridor covers the length of the country from north to south.

I think it is difficult to pursue both social and ecological goals without biasing one over the other. Like other types of conservation areas, there have been concerns over indigenous rights violations during the protection of corridors in developing countries (Colchester 1997). Thirty thousand indigenous people were forcibly relocated so that elephants would be able to move freely across the wildlife corridor between the Kibale Forest Reserve and the Queen Elizabeth National Park in Uganda. The World Bank and other donors funded this project, which is reported in the conservation literature as a “success” due to enhanced habitat protection and successful migration of large mammals after the removal of “encroachers” in the corridor zone (Bennett 2003). Protecting the dispersal of plants and animals can bring the needs of human beings into conflict with the habitat requirements of other species.

³³ Initial PPP investments target a major highway from Mexico to Panama. The plan also includes the expansion of railways, wet and dry shipping canals, ports, airports, telecommunications, electrification, and gas pipelines. By creating physical infrastructure, the PPP sets the stage for the extension of free trade. The PPP is predicted to shift the region’s economy toward assembly plants and manufacturing.

The most basic controversy surrounding corridors involves whether there is enough scientific documentation available to back their suggested importance as a conservation tool (Bennett 2003). Similar to on-going debates over protected areas design, there is disagreement on the required size and shape of corridors. Meanwhile, some scientists suggest that there may be negative consequences from corridors, such as facilitating the spread of fire, disease, and introduced species, which may outweigh positive results. If corridors are insufficient size or quality, they could act as traps or sinks (Simberloff et al. 1992). Another area of controversy involves the cost-effectiveness of corridors in comparison with other types of conservation areas and methods (Bennett 2003). It may be economically prudent to retain existing corridors, but the establishment of new linkages may be costly (Simberloff et al. 1992).

Bennett (2003) believes that the acceptance of the corridor concept has outpaced scientific collection of data on the potential utilization by different species. In many areas, corridor plans have been initiated with little practical information to guide design, location, and management. Sometimes the strongest argument in support of corridors is that with ecological uncertainty surrounding the needs of particular species, or the degree of potential climate change, connectivity zones are likely to leave options open. Corridors may have become popular because the concept is easy to visualize and understand. For legislators, they provide an outlet to promote conservation, whether or not the specific benefits are definable or scientifically justified. It is hard to determine cost effectiveness when the desired conservation goals are vague. Thus, the appropriateness of a corridor as a conservation option is hard to weigh against other alternatives.

Community Sawmills

Until recently, conservation projects often shied away from timber extraction and opted for non-timber forest products, such as medicinal plants, nuts, or rubber. Today, there is more support for small sawmills due to potential economic benefits for local communities (Gretzinger 2003). Village sawmills are expected to promote sustainable management. Local populations generally have more invested in the long-term health of nearby forests than logging companies, who receive either short or medium-term concessions. With proceeds from logging, community members can be trained and hired as forest guards and fire wardens. Tree nurseries and reforestation programs can also be initiated. As community members become involved in the writing of production plans, they gain knowledge about state environmental norms and management tools. During planning, parcels are set aside for conservation and regeneration, along with areas for logging and a variety of human uses. Previously, without management plans, community members may have logged riparian zones or other fragile areas. Community members may also have extracted specific species beyond their capacity to reproduce, whereas management plans clearly identify yearly quotas and felling cycles to allow for regeneration.

Advocates of this model, such as WWF, believe that by increasing local capacity and reducing the number of intermediaries between villages and processing or marketing outlets, local groups are able to keep a larger percentage of potential profits. Projects usually incorporate technical design and implementation of management plans, forest extraction, basic processing, and marketing so that forest dwelling villages can gain the skills to oversee a range of production activities instead of being reliant on, and often

exploited by, outside companies. Core economic benefits arise from local employment and added value through processing. Additional benefits often include social programs focused on education and training, leadership, and empowerment.

Community sawmills are promoted as a method to reduce pressure to deforest in protected areas, old growth forests, and regenerated secondary forests. Populations living near parks are not as tempted to harvest illegally if they have sufficient production areas outside of conservation allotments. By increasing employment in technical roles, processing, and reforestation, local populations can harvest fewer trees and still improve standards of living. Further, employment alternatives draw people away from commercial slash-and-burn agriculture. Clearing for subsistence production is likely to continue by family members not hired in the mill, but smaller areas are required and plot rotations are not rushed by expanding subsistence needs.

Community sawmills are increasingly promoted by conservation organizations, such as WWF, and donors, such as the World Bank. When utilized, however, these agencies may insist that village enterprises receive international certification, reforest or restore damaged habitats, and create plantations in suitable environments. After decades of strong criticisms of World Bank activities on the part of environmental groups, the bank transitioned away from funding production forestry in natural habitats. Based on concern that conservation initiatives were not addressing local poverty, pilot projects involving community sawmills were recently established in some areas, such as Nicaragua.

Advocates of this model believe that by reducing the number of intermediaries between villages and processing or marketing outlets, local groups receive a larger

percentage of profits. Projects may incorporate technical design and implementation of forest management plans, forest extraction, basic processing, and marketing so that forest dwellers can gain the skills necessary to oversee a range of production activities instead of being reliant on, and often exploited by, outside companies. Core economic benefits arise from local employment and added value from processing. Additional benefits often include supplemental social programs focused on education, training, leadership, and empowerment.

Community sawmills can be difficult to implement unless communities are well organized and trained. Administrative complications may emerge from the lack of experience on the part of community members in managing a corporation or owning and maintaining machinery. Some case studies demonstrate dependency on outside donors and business consultants and the consolidation of project benefits within elite circles (Brook 2004).

Certified Forest Concessions

For many years environmentalists have targeted their campaigns at politicians...With market certification, they turned their focus...to the market and to consumers.
(Rametsteiner and Sumula 2003: 88)

The rise of certified forestry from the early 1990s to the present is remarkable. Certified forestry is the strongest example of non-state, market-oriented governance mechanisms, but other examples such as fair trade coffee and certified sustainable fisheries have also developed rapidly (Cashore 2002; Cashore et al. 2004; Gulbrandsen 2004). International certification requires the evaluation and approval of an independent, formally-recognized body that uses standardized criteria to assure that management practices are ecologically sustainable. There are two major types of certification. The first

refers to specific forest management units. The second is product labeling along a “chain of custody,” which refers to the process of tracking wood from its certified forest source through the supply chain to the customer. Lumber carries the logo or ecolabel of the body that verified the forest management unit or product trade.

There are two primary objectives of certification (Elliott 2000). The first is to improve the environmental, social, and economic quality of forest management. The second is to ensure market access for certified products. There are numerous secondary objectives, including the improved control of logging operations, the reduction of illegal harvesting, higher recovery of royalties and taxes, increased transfer of funds to forest management, internalization of environmental costs in timber prices, encouragement of investment in wood-processing industries, improvement of productivity and cost savings along the production chain, and improved transparency in forest management and trade.

Certified forestry faces important challenges. The original goal was for consumers to drive a transition to sustainable lumber, but, in fact, there is often more supply than demand. Case studies also demonstrate inconsistencies in certification procedures within and among some developing countries (Rainforest Foundation 2002). There can also be limitations in the understanding of local cultural norms and land tenure attributes on the part of international evaluators (Brook 2003).

Part of the impetus for the creation of forest certification has been linked to the refusal by the International Tropical Timber Organization (ITTO) to support an ecolabeling system in the late 1980s (Tarasofsky and Downes 1999). Failure at the 1992 United Nation’s Conference on Environment and Development (UNCED) to define a forest convention also played a role (Cashore et al. 2004). Since public international law

neglected sustainable forest management criteria, market-based certification schemes were expected to fill this gap (Humphreys 2003).

There was rapid development of the Forest Stewardship Council (FSC), which was the first major international certification body. FSC was founded in Canada in 1993 and legally registered in Mexico in 1995. In October of 1995, FSC legally accredited four certifiers: Scientific Certification Systems (SCS), SmartWood, SGS-Forestry, and the Soil Association. FSC accredits certifiers that comply with their criteria, and then they are able to certify producers who use the FSC logo on their products.

Once the process was established, certification was pushed by two of the strongest international actors in the forest sector. In the late 1990s, the World Bank and the WWF announced a shared campaign to achieve the independent certification of two hundred million hectares of forest by the year 2005. The promotion of certification may influence a reduction in corruption and illegal logging within firms interested in certified markets because only legal enterprises with strict standards for documentation meet requirements. Chain of custody certification involves being able to trace lumber from the source area through all transportation, processing, and marketing.

A series of FSC competitors have arisen and there are important differences among certification bodies, but my research focuses only on the FSC since it was the only certification system used in Central America during fieldwork (Cashore 2002; Cashore et al. 2004). First, FSC resists business dominance with strong social and environmental stakeholder participation, while many of the other systems are more industry-oriented. FSC's policy scope is generally broader and includes rules targeting labor, indigenous rights, and social and ecological criteria. Other schemes focus more narrowly on forest

management. Another major difference is in the evaluation process. FSC has a performance-based system, meaning that they utilize mandatory on-the-ground rules. Other certification schemes are systems-based or combine performance with systems criteria. Systems-based policies are less concerned with specifics of the actual management process as long as environmental criteria are met. This leads to more flexibility for producers. Critics argue that the FSC performance-based system is inflexible (Elliott 2000).

The FSC has ten global principles to guide the certification of socially just and ecologically sustainable forestry, and all FSC certifiers follow these same principles. The principles assure that the producer under review complies with all FSC criteria, demonstrates clear land tenure and legal use rights, respects indigenous rights, maintains positive relationships with local communities and workers, promotes the viability of multiple products and services from the forest, conserves biodiversity, limits environmental impact, follows a management plan, has a system of monitoring and evaluation, and conserves “high value” forests. If they have plantations, these must be managed in accordance with the above principles.

NGOs, in particular WWF, played instrumental roles in FSC’s establishment. NGOs were interested in gaining leverage to pressure corporation to improve forest management practices, especially in tropical regions. Certification provides a “carrot” approach through economic incentives, such as price premiums or access to new markets, to bolster the earlier use of “sticks,” such as boycotts (Cashore et al. 2004). Social and environmental groups play an integral role in FSC decision making due to a three-pronged system that balances ecological, economic, and social advocates. FSC

governance was created with the intention to avoid dominance by any sector or particular nation(s). Two criticisms of forest governance negotiations at the 1992 Earth Summit were that groups with economic interests were able to influence a lack of commitment to forest policy and that northern groups dominated southern groups. The structure of the FSC is set up to avoid these problems. With the involvement of a broad range of civil society stakeholders, FSC is arguably the most inclusive and participatory certification structure (Gulbrandsen 2004).

Some credit for the rapid advancement of forest certification belongs to large transnational corporations, in particular Home Depot, Lowe's, Ikea, and B&Q, due to their commitment to purchase certified lumber. Nevertheless, at a global level, the demand for certified lumber is lower than expected. Certification markets are not driven by "ordinary" customer preference (Gulbrandsen 2004). Preference studies have shown that only a portion of the population is willing to pay more for ecolabeled products. Gulbrandsen reports that the premium that customers are willing to pay for certified products is small.

Producers in temperate countries are best positioned to take advantage of the opportunities offered (Richards 1999; Thornber 2003). There can also be significant costs associated with certification, mostly because audits and assessments are costly, especially in rural areas of developing countries where repeat visits are often necessary. There are also costs associated with improving forest management to an acceptable level, including the need for increased investment in planning and documentation and potentially lower yields to protect ecological integrity, including regeneration, and set aside forest area for biodiversity and watershed protection (Elliott 2000). Elliott also notes that there can be a

different distribution of costs and benefits over time. Operations in developing countries may be less able to increase investment in planning up front. Certification may involve forgoing harvest in areas placed under conservation. While conservation areas range in size in certified forest management units, they are a standard component. Certified areas in Nicaragua left precious species standing for longer in order to encourage regeneration by mature trees (author's fieldnotes). This practice that may be more profitable in the end, but it reduces the immediate profit from logging.

For Gulbrandsen (2004), the potential for certification to provide incentives for sustainable forest management rests in five characteristics. First, there is considerable inclusiveness in the development of standards with the balance of power between ecological, economic, and social groups. Second, the environmental and social standards are strong by international standards. Ecological standards have the potential to promote the protection of old-growth forests, rare and threatened species and their habitats, restrict clear-cutting, and limit the use of chemicals. Social policies protect workers rights, indigenous rights, local community well-being, and promote more just distribution of resources. Third, the quality of auditing goes beyond most alternative monitoring systems because reviews are regular and involve site visits. Fourth, there is the potential for widespread supply side participation leading to a substantial impact on global forestry practices. Fifth, there is already considerable demand side penetration and marketing of products and potential for continued sales growth and market expansion.

There are important concerns about equity in certified forestry (Thornber 2003). Not only are most of the certificates in developed countries, they are dominated by industrial enterprises. Community forestry makes up as small portion of certified areas

and is likely to remain that way because small enterprises are disadvantaged in the global FSC structure. For example, there been less participation in the creation of certification standards on the part of developing countries, the number of representatives from small-scale operations has also been fewer. Small operations generally have less access to market information that will guide them in their transition from conventional practices when compared to multinational or integrated firms. Less profit from smaller levels of production may also restrict their ability to bear additional costs as a result of certification. Meanwhile, small certified firms may not be able to sell for prices that are competitive with industrial growers. Lastly, industrial firms that accessed “green” markets earlier have gained a headstart, thereby reinforcing inequities for producers in developing countries that are just now looking for markets. Markopoulos (2003) has documented similar constraints in community-based forest enterprises across Latin America for obtaining certification and competing in international lumber markets.

Indigenous populations can be underprivileged within FSC certification processes (author’s fieldnotes). Thornber (2003) notes that FSC systems have tended to not regard local populations as potential managers, don’t recognized undefined forest areas like untitled communal holdings, and require formal rather than flexible management approaches. In Nicaragua, production from indigenous villages ranges in quality and quantity from month to month, which can be a disadvantage in export marketing, where most certified lumber is targeted. In spite of the claim that social justice concerns are integrated into forest certification, I argue that market mechanisms often do not address issues outside the market, such as indigenous land policy or representation, as I will demonstrate in the Nicaraguan cases.

Big-Leaf Mahogany and Trade Restrictions

Trade restrictions to control overexploitation of particular species have been utilized for a long time. The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) was developed in 1973. CITES is administered by the United Nations Environmental Program (UNEP). CITES is large-scale in that it covers international trade and has more than one hundred and fifty member countries, but it is narrower than the other aspects of forest management under review because it is a single species (or group of species) conservation mechanism. Member states regulate trade in thousands of species of flora and fauna. Over the past decades, CITES control over trade of endangered wildlife has yielded mixed results (Hemley 1994). Campaigns such as the international ivory ban captured global attention. Yet, illegal trafficking still continues pushing some endangered species closer to extinction. Trade in threatened species is profitable, making exportations difficult to control. Difficulties also stem from the need to protect local livelihoods while establishing national quotas and international regulatory processes.

CITES monitors big-leaf mahogany exports. This species is the most precious tree in many Latin American countries, including Nicaragua. I argue that the current protection of big-leaf mahogany through CITES is different from other biodiversity conservation efforts because the species is *not* immediately endangered. The natural range area still extends from southern Mexico through Central America to a large area of South America. Due to market pressure, big-leaf mahogany is in danger of *commercial extinction* in several source countries. Recent inclusion of big-leaf mahogany in CITES' Appendix II, which requires the monitoring of all export trade of the species, highlights

political and economic influences in conservation policy. CITES' mahogany policy fits with the other case studies because social and political factors influence efforts for management. It is also similar because there are international institutions networking with partners at multiple scales to transform forest extraction and trade. However, the case of CITES is different from the other case studies because it is not necessarily a market or commerce-oriented solution, but rather an attempt to regulate a historical tendency for trade to focus on precious species until they are pushed beyond their regenerative capacity.

All species listed in any of CITES' three appendices require export documents. Species listed under Appendix I are threatened with extinction and commercial trade is essentially prohibited. Appendix II species are not yet threatened, but they may become so if trade is not regulated. For these species to be exported, the source country must demonstrate that extraction is sustainable through the use of scientific non-detriment findings and a quota system. Appendix III usage stems from a unilateral decision by a member state to list a particular species. Species with this listing are protected within the borders of the member country that makes the request. Other CITES member nations should grant assistance to this country to regulate trade of this plant or animal by keeping track of their own imports and exports.

The three appendices make up the heart of CITES and are central to its function. Each member state is largely responsible for their own implementation. The CITES Secretariat, located in Switzerland, has little ability to enforce listings (Hemley 1994). A standing committee provides general policy and operational direction, which also reviews major infractions on the part of member countries, although there is little that it can do to

punish violations. Some member states would like to see the committee have greater authority to enforce the treaty, while others believe that it has exceeded its administrative role when it has intervened to halt illegal trafficking in the past. There is also a standing technical committee for plants and one for animals. These committees help to monitor status and trade and maintain standardized species name lists. In addition to these committees, formal working groups are sometimes established for issues requiring special attention. In general, CITES is open to and seeks participation from NGOs, which contrasts with some other state-centered environmental governance agencies. While NGOs do not have voting power in meetings, they provide important technical support and monitor illegal exports.

CITES maintains a fairly simple and somewhat decentralized organizational structure. When a state becomes a party, they must set up CITES management and scientific authorities that are independent of one another. The scientific authority decides if trade will be detrimental to the survival of particular species and monitors the impact of export volumes on protected native species. The management authority's responsibilities are often carried out by a government office, such as an environmental ministry. CITES member states must submit annual reports on all species listed in the appendices. They are also expected to attend Conference of the Parties meetings and once there, participate in the review of policies. CITES leaves it to individual countries to determine their involvement. Overall, the success of the convention depends on the political will of each party. CITES requires cooperation among exporting and importing countries to function. It has a quasi-governmental structure partnering states with expert NGOs and individual scientists. CITES' policy decisions are made at the Conferences of the Parties (COPs)

held every two and a half years (Hemley 1994). The convention requires the approval of two thirds of member states to reform species listings and other policies. Any member nation may make reservations about the listing of particular species. They are not under obligation to fulfill CITES' requirements during exportation, but they forfeit their voting rights and are considered a non-party with respect to trade in that species.

True neotropical mahogany consists of three species in the same genus of the Meliaceae family. Caribbean mahogany (*Swietenia mahagoni*), Pacific mahogany, and big-leaf mahogany, are currently all protected under CITES' Appendix II.³⁴ Big-leaf mahogany was recently moved from Appendix III, where it had been listed by six Latin American countries since 1995, to Appendix II. Nevertheless, CITES has rarely targeted tree species. Overall, only around thirty listings refer to trees, although many more are threatened (Glastra 1999). The inclusion of tropical timbers in CITES has been controversial because they are widely marketed and there are other multilateral agreements and institutions, such as the International Tropical Timber Organization (ITTO), with competing mandates.

In 1994, CITES members created a Timber Working Group, with equal representation from boreal, temperate, and tropical forest states, developed and developing countries, timber-producing and timber-importing states, intergovernmental organizations, such as the ITTO, and NGOs (Downes 1999). More recently, a Mahogany

³⁴ Caribbean mahogany and Pacific mahogany have severely declined as a result of overextraction and habitat destruction. Pacific mahogany was listed in CITES Appendix II 1975 and Caribbean mahogany was added 1992. Big-leaf mahogany was listed on Appendix II at the 12th Conference of the Parties in Santiago, Chile in November of 2002. Inclusion came into effect on November 15, 2003. The international policy covers mahogany logs, sawn wood, veneer, and plywood, but excludes other parts, derivatives, and transformed products.

Working Group was created with members from range states, importing states, a CITES Plants Committee representative, and other interested parties.

Since 1950, Central America has seen the decline of more than seventy percent of big-leaf mahogany populations (CITES Secretariat 2003). Nations of the isthmus were instrumental in adding the species to CITES appendices.³⁵ In recent years, Nicaragua has been the largest Central American big-leaf mahogany exporter. Since the mid-1990s, illegal trade has been particularly rampant in Nicaragua. The mahogany distribution area originally covered nearly eighty percent of the country. By the late 1990s, more than half of this distribution area had been lost. It is still found in the eastern Nicaraguan study area, in spite of a history of exportation. Data on Nicaragua mahogany is unlikely to be accurate due to illegal trade, institutional irregularities, and weaknesses in maintaining accurate statistics. In 2001, it was estimated that illegal trade accounted for sixty percent of the total (TRAFFIC 2001a). This number may be underestimated. The Tropical Science Center (2000) reported that illegal mahogany harvest in Central America oscillates between one and two cubic meters of illegal lumber for every cubic meter that is legal.

Under contract with CITES, the South America office of an organization called Trade Record Analysis of Flora and Fauna in Commerce (TRAFFIC), a wildlife trade

³⁵ In 1995, Costa Rica was the first nation to request an Appendix III listing for mahogany. Natural populations in this country had been virtually wiped out. Although other nations had previously put forward a proposal in CITES Conference of Parties for the Appendix II listing, it was the proposal by Guatemala and Nicaragua in 2002 that was finally accepted. Since 1992, different parties had been working for the inclusion of big-leaf mahogany in Appendix II, but the necessary two thirds majority approval was not met. There were six votes too few at the Conference of Parties in 1994 and then again in 1997. In 1995, after the first two failed attempts for Appendix II, Costa Rica requested that big-leaf mahogany be added to Appendix III. Both Bolivia and Brazil followed in 1998. Mexico added big-leaf mahogany in 1999. Colombia and Peru did so in 2001.

monitoring program of the WWF and World Conservation Union, prepared a 2001 report on big-leaf mahogany Appendix III implementation. Lessons may shed light on potential challenges for the more recent listing. TRAFFIC reported that Appendix III did not appear to lower illegal trade in Nicaragua, but there was a reduction in overall illegal trade, especially in Brazil and Peru. TRAFFIC found that compliance was often incomplete and many countries had no penalties for violations. In Central American nations, there was confusion about export, import, and re-export document requirements as a result of the CITES listing. A range of certificate of origin documents was used and many times those accepted were issued by offices other than CITES. Re-exportation was particularly difficult to trace. Standards were often different between countries. Authorities had difficulty identifying mahogany at borders and ports; unidentified mahogany specimen were passed without CITES documents. When identification did occur, the documents used to demonstrate legality were frequently unreliable and, in some instances, were falsified. Differences in standards between countries and difficulty in tracing true origins created loopholes seized as opportunities for illegal export.

Since big-leaf mahogany's Appendix II listing is so recent, there are few reports on compliance. For requirements to be met, two important criteria must be addressed: the specimen must have been legally acquired, and its exportation cannot have a detrimental impact on the survival of the species. One challenge for proving legal acquisition is that documents may be forged or permits tampered. The scientific finding of non-detriment and establishing quota systems is complex and difficult. A yearly quota may be set by each exporting country to assure that sustainable levels of production are not surpassed. More research needs to be done to verify actual inventories of mahogany, regeneration

rates, tree growth, tree mortality, and habitat loss, among other factors. The level at which the species can be exploited will depend on specific ecosystem characteristics and will require extensive field studies and, therefore, substantial financial investment. CITES' guidelines challenge states to determine specific regeneration patterns.

Although a member party since the 1970s, Nicaragua has not followed CITES' stipulations closely in the past (Weaver and Bauer 2000).³⁶ National representatives attended CITES Mahogany Working Group meetings since its initiation in 2000, yet there was little commitment to mahogany conservation when the species was listed in Appendix III. However, in 2002, Nicaraguan representatives joined Guatemalans to put forth the proposal to change the status to Appendix II, which was accepted. Since this approval, Nicaraguan officials felt more obligated to monitor mahogany. In 2003, a Managua CITES office started working closely with INAFOR and border officials to control extraction and exports.

If successful, CITES legislation has several important potential implications. First, a potential benefit includes the harmonization of different standards to one international standard. While all convention parties maintain the right to create stricter domestic standards, one agreed unit of measurement for lumber (e.g., cubic meters) would simplify record keeping and statistical analysis, as well as increase the uniformity of responsibilities and enforcement procedures. CITES should enhance international cooperation. Second, CITES will increase public awareness and information. Third, the CITES' requirements may help to eliminate market distortions that favor illegal activity.

³⁶ CITES resources in Managua were limited and there was little coverage in rural areas. There was much illegal trafficking of endangered species within the country and the terrestrial and marine borders were highly porous as recently as 2003.

If party states are able to reduce illegal practices, they can benefit legitimate producers and, thereby, encourage sustainable management. Fourth, there should be improvements in current trade data (e.g., ability to compare specific import/export figures), improvements in trade controls (e.g., training, timber identification) and improved border and port controls. Border and port control has sometimes required involvement from CITES in the case of mahogany and tropical timbers because officials needed training in identification in order to halt the transport of restricted species. Booklets with samples of restricted lumbers have been circulated to some Central American border officials.

One of the greatest criticisms of CITES is that species listings are decided more by politics than by science (Blaikie 1995a). The “Berne criteria,” which were defined by member states in 1976, allowed for substantial subjectivity (Hemley 1994). With some species, in the face of uncertainty, policy makers err on the side of caution. With others, there has been little or no conservation in spite of significant evidence of endangerment.

International agencies have called for widening participation in mahogany conservation initiatives. TRAFFIC (2001b) noted that government efforts to compile and analyze information on mahogany stocks, biology, and harvest sustainability should take into account information produced by local communities, NGOs, academic, and industry researchers. However, they were concerned that efforts to improve information on the status of the species would create a “gold rush” to areas identified with mahogany stocks. The historical trend in mahogany extraction is for loggers to shift production as stocks in harvested areas become depleted and new supplies are uncovered (Gullison et al. 2000). Demand remains high.

Exploitation is driven by continuous and high demand for this extremely valuable wood...International trade is a major driver: even where there are large domestic

markets, the incentive for harvest is driven by high-value export markets (WWF 2002a: 2).

Market optimists believe that as a species becomes scarce, the price will be driven up, leading to a decline in demand. The international value of mahogany has risen in recent years, but demand has kept pace. Yet, some key players in CITES negotiations oppose trade restrictions. WWF (2002b) supports sustainable management of big-leaf mahogany to ensure its further conservation *and* trade. Is it possible to open markets and protect high-value endangered species that are popularly traded? While supposedly interested in stemming illegal extraction, WWF warns of the negative impacts of environmental activism on timber markets.

Disclosure of illegal trade has led to disruption of supply, market confusion, and import restrictions in some cases. This has potentially extremely negative repercussions for retailers of timber sources from illicit traders, as well as the tropical timber market more generally (WWF 2002: 4).

In the case of big-leaf mahogany, there appears to be a tendency to confound species extinction with commercial extinction. Announcing the incorporation of big-leaf mahogany onto Appendix II, the Secretary General of CITES, Willem Wijnstekers, stated, “Illegal logging and unsustainable export levels are threatening to render big-leaf mahogany commercially extinct in the near future, a trend that has been reflected in recent years by rising prices.”³⁷ *Is the role of CITES to protect species, or to protect trade?*

The placement of big-leaf mahogany on CITES’ Appendix II took a decade due to geopolitics as well as controversy over the extent to which big-leaf mahogany is

³⁷ Cited in a United Nations Environmental Program press release from 11/13/03 entitled “CITES trade controls to take effect for mahogany.”

threatened. The Species Survival Network (n.d.) stated, “*S. macrophylla* will soon meet Appendix I criteria if trade is not regulated.”³⁸ This is an extreme statement, considering the wide range area still existing. The U.S. Assistant Secretary of the Interior, Craig Manson, was quoted in 2002, “We cannot take the risk that fifty years from now the only place anyone will see mahogany is in an old desk or chair.”³⁹ Nonetheless, demonstrating broader goals, Manson continued, “The Appendix II designation will ensure that mahogany will be harvested in a sustainable manner and help range states, especially Central America [sic.] countries, better manage their forests.”

CITES’ mahogany policy has the potential to have a wider influence than just species protection because a forest inventory is now required in every source country to determine non-detriment export levels and set quotas. It was decided at the last Mahogany Working Group meeting that all commercial species would be inventoried. Nevertheless, it is uncertain where developing countries will acquire the funding for the costly survey.

Like other international conventions, CITES has budgetary limitations, and generally depends on the generosity of northern member states. Historically, the U.S. has contributed as much as twenty-five percent of the total CITES budget (Hemley 1994). Meanwhile as many as one third of member countries forgo payment of their annual share. NGOs, such as WWF, donors, and trade and industry groups, also contribute operational costs for a range of activities, including international meetings. Nevertheless, CITES mahogany work is often limited by the lack of sufficient funding.

³⁸ Viewed at <http://www.speciessurvivalnetwork.org> on 03/12/04.

³⁹ Viewed at <http://www.doi.gov/news/021114.htm> on 02/11/04.

For CITES to improve monitoring, a major transition will need to occur. As of 2001, there were no mahogany operations in all of South America that met FSC criteria for sustainable management (Blundell and Gullison 2003). As of 2003, only one percent of the species' historical range in Central America and Mexico was certified under FSC guidelines. Buyers do not demand that mahogany originates from sustainable sources and, to date, forest policy in source countries has had little influence on the current patterns of mahogany logging. In Nicaragua and other range countries, harvest and export even continued during earlier big-leaf mahogany logging moratoriums.

Blundell and Gullison (2003) believe that mahogany is an excellent case study to demonstrate how research and scientific findings are not taken advantage of to inform forest management. Decades of research have had little impact on harvesting rates or practices for mahogany. They conclude that due to the lack of political will, and insufficient regulatory and technical capacity for enforcement, there are not sufficient incentives for policies regulating the use of the species to be implemented.

There are conflicting objectives for mahogany at different scales. A core element is the recent perception and definition of biodiversity as a common good. This signifies that the global right to protection of a particular species from potential extinction must be considered along with local use rights. Biodiversity has begun to be treated as a multi-scale common-pool resource in the way that the earth's atmosphere or oceans are. This idea of shared rights and ownership is a tactic employed by international conservation groups when they try to control or limit local access. It is now difficult to separate the global biodiversity rights from local use rights. Yet, what appears beneficial or justifiable at one scale may appear just the opposite in another context. Actors at each scale propose

that it is necessary to control the access of illegal mahogany, but scale each also attempts to assure their future income from the valuable specie. The international policy demands of politicians in forest-rich developing countries, forest-poor developing countries, forest-rich industrialized countries, and forest-poor industrialized countries are different. Northern states tend to see deforestation as a global environmental issue, while southern states see it as a local one. Claiming sovereignty over their forests, southern states often resent northern interference into what they see as their right to forest development (Humphreys 2004).

Big-leaf mahogany is one of CITES' greatest challenges to date (Rodan and Blundell 2003). This is the first time that a heavily traded tropical timber species will be regulated under Appendix II. CITES may lose credibility if it is not able to carry out its mandate (Snook 1996). With insufficient record keeping and deceptive trafficking practices, Appendix III listings from 1995 to 2003 created a veneer of legality for imports into the United States, the country that purchases approximately sixty percent of the total annual big-leaf mahogany supply (Blundell and Rodan 2003). The use of CITES may, in fact, create a mistaken guarantee that mahogany was sustainably harvested and legally exported when it was not.

Pressures to extract big-leaf mahogany are intense (author's fieldnotes). There is a strong international market where a cubic meter of sawnwood values between \$1,200 and \$1,500 dollars (Blundell and Gullison 2003; Rodan and Blundell 2003). Many Latin American countries consider mahogany exports an important source of foreign revenue. Big-leaf mahogany is currently one of the most valuable tree species harvested from tropical forests in the Americas. Total international revenues in export sales are over one

hundred million per year. The value per cubic meter has nearly doubled over the past decade (Veríssimo et al 1995). Each large mahogany tree could produce up to \$100,000 worth of high-quality furniture if efficiently processed, but the majority of lumber from Central America is shipped semi-processed and even the US\$1,300 per cubic meter price is not achieved. In rural areas, the price is considerably lower: remote Prinzapolka indigenous communities often sell a cubic meter of roundwood or squared timber for twenty-five dollars (author's fieldnotes).

A question has been raised if trade bans are an effective means of protecting species. It has been estimated that forty-five percent of CITES-related trade goes unreported worldwide. CITES is especially criticized for not being able to do more to halt the ivory trade: even with a quota system, countries found ways to circumvent regulation. If ineffective, CITES can create a false sense of security that lumber originated from sustainably managed forests. On the other hand, CITES and certification have raised awareness, increased knowledge, and elevated discourse on sustainable resource management.

There are potential shortfalls in CITES regulations in Nicaragua (author's fieldnotes). First, the policy does not address domestic trade. Second, there are high administrative costs and inadequate funding. Third, the fact that state forest policy has failed to accomplish its goals in Nicaragua because it is not upheld places the effectiveness of CITES in doubt. Fourth, local institutions did not participate in formulating mahogany policy, have economic incentives to continue extracting the species, and often feel that they lack other viable economic options. Other top-down policies have had limited impact in controlling unsustainable forest extraction. RAAN

populations are often focused on equity, rights, and markets, and species conservation is generally not a central concern. Fifth, while additional training and resources under CITES creates the opportunity to improve oversight, if bureaucratic procedures are not clarified and overlaps unresolved, added complexity could make enforcement more difficult and strain agencies in developing nations.

CITES is essentially a narrow policy targeting individual species, but its multi-scale and network properties are complex. CITES is a large-scale solution, which may be required to monitor trade supply along with demand. The FSC, which oversees trade in certified forest products, is also global. Global-scale policy is usually standardized and thus is less flexible. CITES involves international NGOs, yet the structure remains strongly linked to central governments. Indigenous participation in the organization was not discussed in any sources I reviewed during my research.

CHAPTER SUMMARY

Whether one supports international donors' methods or is skeptical of their ability to change, the bottom line is that they are often economic institutions within a financing regime (Najam 2002). As such, the World Bank's forest sector focus is industrial forestry in plantations and efficient lumber production, which is not generated in natural forests in the tropics. Poverty reduction through extraction in natural forests is a tiny piece of one small sector, which makes up only one portion of the bank's overall environmental and economic activities.

Analyzing actual forest projects sponsored by transnational development agencies can help to determine if policy shifts assisted activities occurring on the ground in developing countries and if the rhetoric for reform has translated into action. Each of the

models discussed in this chapter may provide important incentives for conservation, but they do not work in a vacuum. Many organizers now recognize additional needs, such as addressing land tenure insecurity and constraints to local participation in decision making, balancing market-based strategies with programs addressing social and ecological criteria, and developing governmental and nongovernmental institutional support. Nevertheless, it is not easy to implement broad reforms even when they are deemed important.

CHAPTER THREE

The Somocistas versus the Sandinistas

While presenting forest extraction and state policy from the late 1890s, this chapter focuses the period from the 1930s until the present. There was a major political transition from the Somoza family dictatorship to the Sandinista Revolution. Although much could be said about these two regimes, the brief discussion that follows is largely focused on forestry in the RAAN. In spite of major ideological and governance differences, some trends are apparent in both these periods, as well as the decades before the Somozas entered power and since the Sandinistas left in 1990. The first was a dominance of state “forestry,” which viewed the forest narrowly as a timber source. Second, there was a pattern of lost opportunities and poorly managed forests. The final similarity across time was conflict over land tenure between indigenous populations, logging companies, and the state.

Foreign companies, in particular those from the U.S., have historically received a large portion of the benefit from forest enterprises in eastern Nicaragua. Since the 1950s, there has been foreign involvement to improve forest production and management. This adds to, and extends from, earlier periods of outside intervention in the Moskitia, including colonization and imperialism. While contemporary processes provide the core of my analysis, it is important to highlight that foreign representatives have played an important role in formulating Nicaraguan governance for centuries (Dozier 1985; Naylor 1989; Hale 1994; Offen 1999).

EARLY FOREIGN EXTRACTION AND STATE POLICY

A United States logging company, the George D. Emery Company of Boston, received an early monopoly in the region by consolidating their previous concession from 1885 on the Grand River with another belonging to a Canadian named J.C. Crookshank (BCN 1975). Combining these concessions equaled ten percent of the total Caribbean region (Weaver and Bauer 2000). Between 1894 and 1902, Emery extracted 96,000 mahogany trees (Sollis 1989).⁴⁰ The company sent to Boston approximately one thousand logs a month from the Grand River, located just south of the Prinzapolka River (Parsons 1955).⁴¹ Emery employed over 1,300 workers, among them one hundred Americans. Most Nicaraguan workers were local indigenous people. During this same period, Parsons (1955) documented that a small American-owned pine mill opened in 1892 on the Wawa River, slightly north of Prinzapolka. This was one of the first pine operations in the region.

By 1890, ninety percent of the investment in the Caribbean region came from abroad, primarily from Britain, Spain, or North America (Hale 1994). The Nicaraguan government desired control over the region and its foreign investment. In 1894, a military occupation forced incorporation of the Caribbean with the rest of Nicaragua. Once the region was under Nicaraguan control, natural resources were exploited in massive quantities and large land parcels were given to state officials' friends. Control over importation and exportation moved to Managua. The region's natural resources brought

⁴⁰ After eight years a lawsuit shut down Emery's operations (Parsons 1955). It was settled in 1909: Emery paid \$600,000 and withdrew from Nicaragua.

⁴¹ Emery was the only logging company in the historical period that reforested. The company planted seedlings along roadways and in forest openings (Lamb 1948, 1966). These trees were harvested in 1928, but due to political unrest that year they were never exported.

one third of the national income in this period (Acosta 1996). Central government officials looked to create one national market, law, and language. This meant significant restructuring from the previous Miskitu monarchy. In 1895, a National Assembly Commission further clarified this leadership. National officials chose the governor, border inspector, and a regional judge. Indigenous villages were allowed to select a local judge who would resolve minor disputes and crimes; larger infractions were sent to the regional judge.

The first Nicaraguan forestry law, called the Law of Forest Conservation, passed in 1905. It was an ineffective attempt to control deforestation by prohibiting the cutting of all trees and bushes, whether natural or in plantations, or deforesting within one hundred meters of all seasonal or permanent rivers, lakes, lagoons, or clearing on either side of roads or railroad tracks, even if they crossed private property (Ruiz Poveda 1995). The law also: prohibited destroying or cutting vegetation on upper hill slopes and mountains; forbid slash and burn agriculture in areas that were not appropriate for agriculture; required permission from the mayor for burning; obligated reforestation of an equal number of trees whenever they were irrevocably harmed or killed; and required citizens to denounce infractions to local authorities. The emphasis was not forest conservation, but rather the protection of production activities in order to guarantee income. Although decisions were centralized, oversight responsibilities were largely placed on local officials.

The same year, 1905, the U.S.-based Louisiana-Nicaragua Lumber Company supposedly obtained exclusive rights for fifty years to the pine forests of northeastern Nicaragua (BCN 1975). Yet, in 1908, a Managuan Italian named Cagliariis received a

concession for the pine forests along the Bambana and Prinzapolka Rivers in the middle of the region. Like the Emery Company, these large concessions became entangled in political and legal conflicts. Unlike Emery, the latter two never extracted much lumber.

Large-scale commercial pine extraction in the Zelaya Department first occurred with a partnership between lumbermen from Louisiana and the Vacarro Brothers, owners of the Standard Fruit and Steamship Company. These investors formed Bragman's Bluff Lumber Company (Parsons 1955; BCN 1975). Bragman's purchased timber rights to 80,000 acres, creating conflict with the local indigenous people. The company invested approximately five million dollars to develop the town of Bilwi, a deep-water port, and one hundred miles of railroad to transport lumber and bananas. A sawmill was imported intact from Louisiana and a mill for planing was built. Sawn lumber exports began in 1925, and the company was able to produce 55,000 board feet daily at its peak (Vilas 1990). Total lumber exports from the region reached 9.6 million board feet in 1929. To make use of the boats traveling back from the U.S., company stores were set up in Bilwi, Logtown, and later San Carlos (BCN 1975). Employees spent a large portion of their salaries on imported items in the stores, including liquor.

Mahogany continued to attract logging companies, which created an influx of "American speculators and tropical tramps" (Parsons 1955: 54). By 1916, the finances of Nicaragua were managed by two U.S. citizens – one from the State Department, along with the Nicaraguan Finance Minister. Troops were sent to protect U.S. financial interests. U.S. Marines occupied the coast of Nicaragua almost continuously from 1911 until 1932 in order to quell revolts (Dunbar-Ortiz 1990). Starting in 1926, troops under

rebel commander Augusto C. Sandino destroyed the infrastructure of U.S. mining and fruit companies (BCN 1975).

Between 1915 and 1930, Nicaragua's forest products, much originating from Zelaya, made up an average of twelve percent of the nation's total exports (Jenkins Molieri 1986). A boom continued until the Depression at the beginning of the 1930s, but by the late 1930s, Nicaraguan exports rose again to around eight million board feet annually.

Forest legislation from this period focused on the pricing of state services. Between 1912 and 1920, a series of decrees were passed regulating fees and tariffs for the extraction and exportation of various species of lumber (Fernando Solórzano 1922). In 1917, annual licenses were established with harvest areas restricted to two thousand hectares. The minimum log diameter was twenty centimeters. Attention initially focused on lumber to be exported, but by the late 1920s, there was increasing concern over domestic markets. While the central government controlled exportation, local officials upheld the 1929 Decree on Construction Woods. This was the first law that established norms for the internal marketing of lumber from state and private land. Identification marks, registered with the mayor, were to be hammered into the trunks. Sawmill owners were supposed to catalogue and declare the dimensions and class of wood they were processing. Again, the emphasis of the law was state control over forest production.

Similar types of policies were established to control indigenous populations. Starting in 1905, a legislative decree set rules for the measurement of indigenous land and procedures if lands were to be sold. However, it was later realized that many villages were unable to complete these requirements because they lacked legal representatives to

define boundaries. In 1908, each indigenous community was required to create a board of directors (Aviles 1992). Indigenous communities outside of the Caribbean region were included in this legislation and several passed bylaws between 1908 and 1918 defining board structure and responsibilities (CBA 2000). Caribbean communities generally continued with informal procedures in spite of the law.

Over the next ten years, subsequent legislation changed the members of the boards, as well as changed regulations to either allow or prohibit the sale of communal land (CBA 2000). In 1906, the board consisted of a president, three vocals, and a secretary. Legislation in 1914 annulled the previous decree and stated that the board could not sell communal land, but that rental arrangements were permitted. A vice-president was added to the board. A decree in 1918 cancelled previous restrictions and set requirements for the sale of land.

By 1918, there was a legal distinction made between the communities that were ruled by a board of directors and those that were ruled unofficially by elders. Since decrees in 1906 and 1914 gave the executive branch power to approve indigenous village statutes, the president passed norms in 1918 establishing the legal requisites for community representation. These articles did not distinguish between the indigenous populations of Zelaya and other regions. The board of directors was to be made up of a president, four spokespeople, a treasurer, a secretary, and an accountant, who had a voice in decisions, but could not vote. Although positions of officials continued to change, the establishment of annual elections and municipal oversight in the electoral process from the 1918 decree continues to the present. A presidential decree in 1919 formalized the

role of the *sindiko*, who represented each indigenous village in front of state authorities, especially on matters involving land.

EXTRACTION AND POLICY UNDER THE SOMOZAS

Timber extraction flourished under the Somoza family dictatorship, which ran the nation from 1936 to 1979. In the 1940s, mahogany camps were similar to those described more than a century before (Weaver and Bauer 2000), with the Miskitu population being the main laborers (Nietschmann 1973). Extraction was carried out for two to three months a year, but companies worked virtually 24 hours a day. There were some improvements in efficiency over previous periods: logs were often squared before transportation; tractors were now employed, along with oxen, to bring the trees to waterways where they were chained or tied into rafts; roads were increasingly built into previous inaccessible areas; railroads facilitated extraction; and large barges were loaded along the seacoast.

The Standard Fruit and Steamship Company took over Bragman's Bluff Company's areas. In the late 1930s, significantly more pine was shipped than mahogany. Pine operations later slowed during World War II, but then rose to a peak in 1952 when nearly forty million board feet were exported. The cash value of shipments in this year was over two million dollars. Of this total, two-thirds were exported from Bilwi and one-third from Prinzapolka and Karawala. Two new logging companies focused specifically on Prinzapolka, although several of the earlier companies had also extracted from the area. These were Waddell's Prinzapolka Company and the Nolan Company (Parsons 1955). Waddell worked near the Bambana River, which flows into the Prinzapolka. Pine, mahogany, and cedar lumber was transported down the Prinzapolka River and exported

from the coast. Nolan harvested pine near Karawala, located between the Prinzapolka and Grand Rivers. The company mill had the capacity to process 45,000 board feet daily (Vilas 1990).

From 1945 to 1963, the Nicaraguan Long Leaf Pine Company (NIPCO) became the lumber giant of the region (BCN 1975; Vernooy et al. 1991). NIPCO was a subsidiary of Robinson Lumber Company of New Orleans, which originally harvested from Bragman's concession area based on stumpage fees (Parsons 1955). A NIPCO mill built in Bilwi had the capacity of 60,000 board feet daily. In the 1950s, NIPCO produced half of Nicaragua's lumber exports (Vilas 1990). The NIPCO mill burned to the ground in 1953 in what local people have labeled a suspicious fire. Part of NIPCO's operations moved to a smaller mill in Leimus, and a new mill in Bilwi began to focus on big-leaf mahogany (Jenkins Molieri 1986). In 1963, NIPCO stopped harvesting pine altogether and focused on the extraction of mahogany and Spanish cedar from Prinzapolka (Weaver and Bauer 2000).

Throughout the 1900s, extraction was characterized by "boom and bust" cycles: lows were influenced by political unrest and world economic trends (Helms 1971, Nietschmann 1973). Mahogany sales peaked after World War I, but World War II also stimulated mahogany extraction for naval construction. This boom continued after the war because restrictions for civilian use were lifted and mahogany wood became popular. The majority of accessible mahogany in Zelaya was exhausted by the 1950s. The largest trees were also taken. In the 1940s, one company, Weiss-Fricker, reported extracting a mahogany log that was 22 meters long, 3.65 meters in diameter at the butt end, and 1.8 meters at the top (Weaver and Bauer 2000).

In 1948, the Somoza administration reorganized forest governance. A new law initiated a Forestry Department under the Ministry of Agriculture and Work (Ruiz Poveda 1995). The department was to promote the conservation of forests, reforestation, and oversee compliance with standing or future legislation. Nevertheless, the number of personnel was insufficient. In 1954, the entire nation had only eighteen forestry inspectors and eighteen forest guards (Ortega Blandon 1966). By 1965, there were no forest guards and only thirteen inspectors, two administrators, and three people in charge of tree nurseries; none had a degree specializing in forestry. In the 1964-1965 budget cycle, forestry made up 0.088 percent of the national budget. Since eighty percent of these funds were used for salaries and traveling expenses, there was limited money for forestry projects, conservation, or reforestation.

In 1952, the state updated the indigenous policy. A government liaison was again recognized in each village (Christie et al. 2000). This was often the *wihita* (judge), but some communities had an alcalde or sindiko. Executive Decree #491 in 1952 was passed because many communities were not following the election procedures established decades before. The 1952 decree stated village officials should be recognized as expressing the will of the people. To make their role official, it established strict electoral guidelines to be overseen by the Ministry of Government. These guidelines have remained unchanged except for a minor 1968 reform of two articles.

In 1958, a General Office for Natural Wealth was created under the Ministry of Economy, Industry, and Commerce. A legal framework was created for granting extraction permits, licenses, and concessions. The General Law on the Exploitation of Natural Resources also passed in 1958. This immense law had nearly 150 distinct

articles. Its primary object was to clarify administration and financing of forestry and it mandated that all natural riches within national boundaries that lacked other owners belonged to the state. In spite of the vast number of norms within this law, corporate concessions and individual resource extraction continued to be poorly regulated.

There were plans to modernize production in Zelaya in the 1950s and the National Development Institute (INFONAC) was an important part of this initiative (Vernooy et al. 1991). INFONAC was founded in 1953 as a broad-based effort to funnel international development assistance, particularly from the U.S., to improve agriculture and industry in the Caribbean. A core INFONAC program was the Northeastern Forestry Project, which focused on reforestation of pine areas and forest fire control. After initial studies with the support of international experts, President Somoza was strongly encouraged to initiate programs in the pine forests, which in 1957 were predicted to support seven more years of extraction before being totally depleted (BCN 1975). Somoza was motivated by the estimation that with adequate management the pine reserves could generate twenty-three million dollars annually.

In 1965, forest inventories from across Zelaya provided some of the first detailed data (MEIC 1973). The general conclusion was that the forests were seriously degraded: the density of mature mahogany was low and the pine savannas were not regenerating. In spite of numerous small inventories, it was concluded that it was still impossible to ascertain the true forestry potential due to the vastness of uncovered areas. State institutions at this point could not accurately define either state or private land holdings and there were no existing cadastral maps defining boundaries.

In the decades following the passage of General Law on the Exploitation of Natural Resources, smaller decrees continued to be written. These were intended to enforce earlier legislation, but they were also poorly administered. In 1960, another law prohibited the harvest or destruction of trees, wild or artificially propagated, within watersheds. A law for the conservation, protection, and development of forest wealth passed in 1967. Its 34 articles defined specific extraction procedures for minimum forest plans and larger concessions. An attempt was made to stabilize the procurement of lumber by insisting that concessions carry out continuous and sustained extraction during their permit period. Article nine was essentially an export log ban which stated that only processed forest products, such as milled, dried, and chemically treated lumber, plywood, or furniture, could be exported. In 1972, a decree to control forest fires passed. It required permits for the use of fire in agriculture and other production and a fire prevention plan with firebreaks and control mechanisms. This legislation was also poorly implemented. Various times the Nicaraguan state attempted to control forest extraction, increase profit, and protect state interests, but their attempts were unsuccessful.

In the 1972 Political Constitution, state forest ownership was strengthened: all areas with trees and lands defined as having forestry potential were defined as state property. Another surge of forest concessions appeared. These were largely assisted by international development agencies, such as the Food and Agriculture Organization and the Inter-American Development Bank. The largest Zelaya forestry plan in this period continued to be INFONAC. An INFONAC study in this period described the hardwood resources of the northeast as unexploited and the pine resources as promising. An inventory in the pine savannas to the north and south of the Prinzapolka found that

approximately a million and a half cubic meters were immediately available (INFONAC 1974). By 1974, INFONAC holdings had reached more than eleven percent of Nicaragua (BCN 1974). By 1976, the forest reserves under INFONAC totaled 1,600,000 hectares. Areas between the Wawa and Prinzapolka rivers, covering approximately 8,400 square kilometers, had been added in 1971 (INFONAC n.d.). More than 83 percent of this area was officially considered state lands. By 1975, the total logging concessions granted under INFONAC and other private companies covered 27,000 square kilometers. This made up forty percent of Zelaya. Many of these concessions were on communal lands claimed by indigenous populations (Vilas 1990).

With foreign technical and financial support, INFONAC established fire control programs, leading to the regeneration of young plants in large areas of Zelaya (INFONAC n.d.).⁴² There were twelve control towers in the region. The Northeastern Forestry Project infrastructure included two thousand kilometers of secondary roads and more than two hundred wooden bridges (IRENA 1986). While the project's central offices were located in Managua, secondary offices were located in Bilwi, the majority of the more than four hundred personnel lived in Slilma-Lila,⁴³ and a small permanent post was also opened in Alamikangban (INFONAC n.d.). However, the Miskitu were never sufficiently involved in the project and, therefore, continued to burn the pine savanna, partially as a means of protesting the project and also to increase their own earnings when they were hired as firefighters (Vilas 1990).

⁴² There was additional support from the Swiss government, the U.S. Peace Corps, and World Food Program (INFONAC n. d.).

⁴³ A camp at Slilma-Lila covered fifty hectares and had capacity for 1,600 people with 130 family houses, six guest houses, two churches, an elementary school, two cafeterias, potable water and electrical installations, sports fields, and an air landing strip. Slilmia-Lila was an anomaly in the region because of its infrastructure.

In 1976, the Emergency Law for the Protection of Forest Resources passed and an Office of Renewable Natural Resources was created under the Ministry of Agriculture and Livestock. The law prohibited the use of forest lands for agriculture and ranching. Permanent forest reserves were created and commercial harvesting in reserves was banned, unless under supervision of the Renewable Resource Office. The law also prohibited the cutting of trees within two hundred meters of the headwaters of springs, rivers, lakes, reservoirs, ponds, or dams that provide water for populated areas, irrigation, electricity, or other uses. Concessions were still based on the previous General Law on the Exploitation of Natural Wealth, but the executive branch was given the power to cancel any concession. Concessionaires were responsible for reforestation on national lands.

Under the Somozas, the Nicaraguan state created similar rules decade after decade. Many laws would have provided considerable forest protection if they were implemented or enforced. In spite of legislation, uncontrolled deforestation continued. Although ineffective, the 1958 General Law on the Exploitation of Natural Resources stayed in place for two decades.

The above discussion of forest extraction and governance policy does not portray the insidiousness of the Somoza dictatorship, which was premised on highly centralized and elite control of both business and government. As a major trade ally, the U.S. government was largely supportive of the dictatorship. It took a grassroots rebellion on the part of the Sandinista Front to shake this power structure.

EXTRACTION AND POLICY WITH THE SANDINISTAS

Large-scale foreign extraction continued until 1978 with military upheaval during the Sandinista Revolution. With the overthrow of the Somoza Dictatorship on July 19, 1979, the Sandinista Front for National Liberation (FSLN) came to power. The new government confiscated foreign-owned companies. In August of 1979, the Sandinistas nationalized natural resources. They defined the forest sector as important to the internal development of Nicaragua, as well as its balance of payment (IRENA 1983).

The expulsion of foreign companies from Zelaya was unpopular in Miskitu villages in the study area because it reduced employment. The nationalization of natural resources threatened local tenure claims. Suspected Contra fighters and their sympathizers were jailed. Miskitu people in the study area recall that they were unfairly harassed in the early 1980s.⁴⁴ Troops burned two villages along the upper Prinzapolka River.

In 1980, the Sandinistas began to plan development of the forest sector with \$1.4 million dollars of funding from the Swiss government (IRENA 1984). Technical assistance to Nicaragua was given through the International Reconstruction Fund. After years of research and analysis, the Sandinista administration presented a forty-year forest plan in 1986. The administration studied the potential for pine production in RAAN: a pine sawmill was proposed in Alamikangban.⁴⁵ FSLN leaders were concerned about forest losses from the agriculture frontier and planned to initiate biological reserves in the Caribbean. They were interested in establishing plantations as well and carried out initial

⁴⁴ Pers. comm., Spanish, 03/30/03.

⁴⁵ A forest inventory was carried out in 132,028 hectares between Alamikangban and Makantaka in 1981 (INDERA 1991).

reforestation in many regions of the country. A Forest Genetic Improvement Center was created. It had four sub-stations for seed collection, including one in Prinzapolka.

The civil war impacted the ability for the Sandinistas to initiate some forestry projects. They were not able to carry out forest research or production in war zones of the Caribbean (IRENA 1983). In 1983, Contra rebels burned four hundred square kilometers of reforested pine (EPOCA 1986). The FSLN had tried to continue the Northeastern Forestry Project started by the Somoza administration, but fire control ended in 1985 due to lack of funding (Centro Humboldt/CAPRI 1992).

The Sandinistas created an Institute of Natural Resources and the Environment (IRENA) to take the place of Somoza's INFONAC (Vilas 1990). In 1979, one of the initial steps of the incoming Sandinista government was to create the Institute of Natural Resources and the Environment (IRENA) (Ruiz Poveda 1995). IRENA was a decentralized, autonomous entity of the state with its own bylaws. IRENA was to promote integral management, based on scientific studies and inventories of natural resources. Focus was placed on reforestation and the protection of flora and fauna in its natural environment. IRENA was also the regulator of industry and other private extractors. A state inspection system became more detailed. Nonetheless, these goals proved unrealistic due to the inefficiency of IRENA as an institution. In 1988, IRENA was legally terminated.

The People's Forestry Corporation (CORFOP) ran state lumber businesses. By 1982, CORFOP had under it a total of eight forest industries, including milling and harvesting companies, and a plywood mill. Some had complementary processing mills or wood working shops (INDUFOR 1993). The Sandinistas intended to activate numerous

additional companies for lumber extraction in the Caribbean. However, CORFOP industries were never able to achieve stable profits. When the industries were confiscated from previous owners, the managers fled the country, along with the owners. The new FSLN administrators were inexperienced. There were additional economic losses from the reduction of U.S. imports due to political hostility toward the Sandinista administration. Donor reports note that state business managers did not readily adapt the suggestions of international consultants and the poor management of infrastructure slowed the installation of the new machinery from donors. Even with considerable Swiss investment, forest industries deteriorated (INDUFOR 1993).

Sandinista forestry projects in the Caribbean region faced conflict with indigenous populations over land tenure. After the Revolution, the region's main political organization was the Miskitu, Sumu, Rama, and Sandinistas United (MISURASATA). In August of 1980, MISURASATA worked with the National Institute of the Atlantic Coast and IRENA to establish an agreement whereby communities would receive eighty percent of the total value of timber felled on their lands (MacDonald 1988). However, MISURASATA members became increasingly polarized on land issues. MISURASATA denounced the "nationalization" of indigenous lands in the proposed Bosawás Forest Reserve, which was announced immediately after the above agreement was signed. Early on, the government had agreed to MISURASATA completing a land survey of indigenous areas, which would serve as a base for land titling. However, the MISURASATA "*Mapa de Polanco*" demonstrated vast communal land, much beyond what the Sandinistas had anticipated. Other MISURASATA plans combined with these radical land claims led to the government arresting the group's leaders in February of

1981. Miskitu-FSLN relationships deteriorated rapidly and tensions in the region soon escalated into civil war. For a detailed account of this period, see Hale (1994).

In 1987, the Sandinista government granted autonomy to Caribbean regions, partially as a means to quell the Civil War violence in the region. Two new governance scales were created. Zelaya was broken into the North Atlantic Autonomous Region (RAAN) and the South Atlantic Autonomous Region (RAAS). Bluefields, in the RAAS, had been considered the seat of Zelaya, but with the creation of the RAAN, Bilwi became a second regional seat.

The Autonomy Statute built on traditional indigenous governance structures and recognized communal land. Statutes stated that the communities “will benefit from a regime of autonomy which...will guarantee its inhabitants the real use of their legitimate historical rights.” The autonomous regions should “promote the rational use of the waters, forests and communal lands for the benefit and enjoyment of their peoples, and the overall preservation of the ecological system.” Inhabitants of the communities are entitled by law to full equity of rights and to their own forms of communal, collective, or individual ownership and transfer of land. “Communal property is constituted by the communal lands, waters and forests that have traditionally belonged to the Communities.” Most importantly, “Communal lands cannot be sold, seized, or taxed; their communal status cannot expire” (translated in Hale 1994: 231-239).

The 1987 Autonomy Statute should have strengthened indigenous ownership of communal land. However, in Nicaragua, after a new bill passes, a second bill must be created to define how the first bill will be implemented. If the second bill is not approved, as occasionally happens, the first bill remains open to interpretation and may or may not

be followed. Although the initial Autonomy Statute bill passed in 1987, the regulation of these statutes was delayed until 2003.

Many indigenous territories remained without titles and so communal ownership as defined in the Autonomy Statute was unprotected. Meanwhile, state laws mandated that untitled lands belonged to the nation. Like administrations before them, the Sandinistas created policy to reinforce state control over natural resources and concessions. The constitution established in January of 1987 set the legal framework for conservation, but it made an exception for state resource extraction. Article 102 stated,

The natural resources are national patrimony. Environmental preservation and the conservation, development and rational exploitation of natural resources correspond to the State; who can celebrate contracts for the rational exploitation of these resources when national interests require...[translated from Spanish by author]

CHAPTER SUMMARY

Foreign companies have a long history of extraction in the Moskitia. U.S. firms became dominant in the decades prior to the Somoza family dictatorship and continued their hold on the region during this regime. In the 1950s, when the forests of the country were seriously degraded by previous extraction, international professionals began to step in. Corporate extraction continued at a fast rate, but more areas were also placed under state control. This structure continued until the overthrow of the Somoza government in 1979.

A philosophical switch was initiated in the 1980s. The Sandinista government promoted integral forest management and rational exploitation. Yet, limited by the civil conflict, including poor relations with Miskitu villages, and their lack of business experience, the administration was able to accomplish little forest sector development, in

spite of considerable international assistance (Alves-Milho 1996). While the regional autonomy the Sandinistas approved would eventually increase indigenous control over natural resource management, changes were slowly implemented. The complexity of decentralization processes will be addressed in Chapter Five. First, logging sector activities during the 1990s will be covered in Chapter Four.

CHAPTER FOUR

Pine, Mahogany, and Poverty: Extraction since 1990

This chapter examines Nicaraguan commercial forest extraction at both the large and small scales. It highlights decision making in various sectors starting with state officials in two different administrations. Later sections trace the entrance of three of the largest companies into the RAAN and then move to a discussion of the activities of smaller logging operations and lumber intermediaries. I look at the ways that individual and group agency, as well as state policy and market shifts, influence the choice of species harvested. Throughout the discussion, impacts on indigenous populations remain forefront. The analysis of indigenous agency carries over to the Chapter Five, which addresses the re-scaling of forest governance at sub-national scales.

In 1990, Nicaragua's incoming president, Violeta Chamorro, initiated negotiations with multilateral lending agencies. Structural adjustment programs reduced the barriers to trade, shrunk public expenditures, encouraged privatization, and increased exportation. The pace of private logging rapidly increased in the RAAN. The following president, Arnoldo Alemán, also granted numerous concessions to logging companies. Responsibility for the forest sector moved back and forth under different state institutions throughout the 1990s. Attempts to control high rates of deforestation were seemingly always ineffective, as data from my research and interviews in this and following chapters demonstrate.

RECENT STATE POLICY

There was movement from a centrally-planned economy to open markets in 1990 after the Sandinista government left power. The transition from the People's Forestry

Corporation (CORFOP) to private industries was lengthy and required significant international donor assistance, again from the Swiss government.⁴⁶ The eight CORFOP industries were legally returned to the previous owners from which they had been confiscated, but not all were interested in managing them again (INDUFOR 1993). In 1993, many mills were inoperative, some were being dismantled, and some were being run by workers, but production levels were low. By 1994, 343 of the 352 businesses that had belonged to the National Corporation of State Enterprises were privatized, returned to former owners, or dismantled entirely (Arana 1997).

President Chamorro granted numerous long-term fishing, mining, and forestry concessions to foreign companies (Elizondo 1997). The fifty-four logging permits granted in 1991 were held by twenty-one companies with investments from the United States, Mexico, Finland, El Salvador, the Dominican Republic, Costa Rica, and Spain (Gómez and Vivas 1992). Markets for timber opened, but this increased the rate of illegal logging, along with legal extraction. Illegal logging was so severe that in 1992, Chamorro passed a moratorium on all commercial logging. The ban excluded permits that had received approval prior to the start date of the moratorium. The goal was to stop logging until the government could approve a new national forest governance mandate. This is an example of how in the 1990s, Nicaragua employed extreme legislation due to an overall lack of effective forest policy. The approval process for new forest mandates was slow and illegal logging continued to be rampant. The annual rate of deforestation in Nicaragua between 1990 and 1995 averaged 150,800 hectares a year (Roldan 2001). By

⁴⁶ Nicaraguan assistance from the Swiss government continued under Somozas, the Sandinistas, and through neoliberal administrations to the present.

1996, the National Assembly tried to limit concessions because more than one hundred solicitations for exploration and exploitation in the areas of mining, fishing, and forestry were made in June alone. A law passed in the assembly that would have restricted the types and amounts of concessions, but Chamorro vetoed parts, stating that it was bad for the economy (Mitchell 1996).

State foresters drafted new regulations which passed in October 1993, but an Inter-American Development Bank advisor then carried out consultations with a vast number of institutions (Ruiz Poveda 1995). There were twenty-seven drafts of the law before it was finally signed by the president. The legislation created a National Forest Service that established permissible annual cutting volumes. Quotas were set for each territory and all extractions needed an annual permit. All transportation of lumber required forest transport permits. Processing companies were to complete monthly reports. All installation or relocation of sawmills required permission and industrial sawmills required an environmental impact assessment. Many of these requirements stand today. Some requirements from Somoza-period legislation were repeated. For example, it was prohibited to cut within two hundred meters of rivers, lakes, and reservoirs, harvesting was restricted in areas with high slope, and fire prevention plans were required.

All taxes, technical services, fines, auctions, and sales of forest products were administered through the National Forest Service. Illegal activities, such as harvesting or processing without a permit, were fined. Additional forest management responsibilities were established under other agencies. A State Forest Administration was created to administer and manage state forests and state land with forestry vocation. The National

Park Service was responsible for forests that were located in reserves and protected areas. A National Forestry Commission was created to implement a Forestry Action Plan.

President Chamorro followed international donor recommendations and northern hemisphere trends toward development planning. Donors supported Nicaragua's work on a national forestry action plan. The plan aimed to improve cooperation between state institutions, identify and harmonize existing forest legislation, define forest ownership and establish responsibility for reforestation, initiate clear policy for financing forest management, and eliminate preferential policies that promoted deforestation. It also mandated involvement of local populations in the planning, decision making, and management of forests.

In 1994, a Ministry of Natural Resources and Environment (MARENA) was created. The National Park Service was eliminated and MARENA took over the management of protected areas and biodiversity conservation. Chamorro created many parks and protected areas with rules borrowed from international actors, such as the IUCN, WWF, and the UNEP. Although the number of national reserves reached sixty-six by the mid-1990s, it was unclear what activities were allowed in each (Ruiz Poveda 1995). Boundaries were not maintained and local residents were often unaware of the existence of the protected area. The forest reserve in Alamikangban was created in this period. The lack of clarity over boundaries and use restrictions would later impact case studies in this research.

An especially ineffective policy created by the Chamorro administration was the decommissioning and auctioning of illegal lumber. This policy continued under subsequent administrations and was the source of considerable conflict in my research

area. Theoretically, the auction was a simple process. An INAFOR official explained, “When we auction off lumber, we put up posters with the base price. People come to bid and whoever offers the highest price gets the lumber.”⁴⁷ The process came to be seen as a way to legalize lumber because confiscated wood was often auctioned to the same people who were caught extracting or transporting it in the first place (author’s fieldnotes).

Intermediaries targeting decommissioned illegal lumber focused on places like Prinzapolka. Auctions created conflict with local populations because intermediaries offered local loggers a lower price due to the extra expense involved with the legalization of the lumber. For example, in 2002-2003 Prinzapolka loggers would be paid five to six cordobas, which was less than fifty cents, per board foot for mahogany. With the additional costs from purchasing auctioned lumber, purchasers only pay four cordobas, which is equivalent to less than thirty cents. Auctions have also been known to create conflict between the RAAN’s two separate INAFOR districts because one district may auction confiscated lumber that originated in another. A village member complains, “Local people are harmed the most by the fines for illegal extraction, and INAFOR gains. INAFOR blames us, but they are making a profit off of us. The *coyotes* [lumber intermediaries] should absorb the fees, not the community.”⁴⁸ Intermediaries are unpopular because they often leave debts and tell local extractors that they measure less lumber than they actually do to pay less. According to a local logger in 2002, “They say there is a sun crack, or insect damage, and they take off a half foot or more. And they also subtract for limbs. But they are going to be able to sell that lumber.”⁴⁹

⁴⁷ Pers. comm., Spanish, 03/11/02.

⁴⁸ Pers. comm., Spanish, 10/17/02.

⁴⁹ Pers. comm., Spanish, 11/11/02.

In 2002, an INAFOR official defended the auctions to community members in Prinzapolka.

You are always at risk of losing raw materials that are harvested illegally. If we keep helping loggers get out of their problems, people are going to keep cutting illegally. I want to help because I am aware of local necessities – but how do I know illegal extraction is going to end?⁵⁰

The official tells villagers, “If you cut illegally, others are going to benefit. If you do not want the state to end up with large fines, then you have to work legally with management plans.” Another INAFOR representative explains, “The auction is not a process to make the illegal lumber become legal. We are trying to diminish illegal extraction so that there is increased sustainability. The disincentive we are using is a large fine on decommissioned lumber.” A third official adds:

We can’t change things overnight; it is a slow process. In the interim, we need to decommission wood. INAFOR does this because it is looking for a solution. This is not a real solution because it only benefits a few. If we look for a solution that will benefit all, it is a long process and involves organization at all levels.⁵¹

These statements, although logical from the perspective of the state, ignore the impediments that local people face to sponsoring legal management plans, such as funding a forester to survey the area and write the plan. In the final quote the official acknowledged inequitable benefit from the auction process. I concur that changing the incentive structure will take time. In my analysis, any solution to illegal logging will require efforts at many scales and in many sectors. Some illegal practices that occurred in Nicaragua from 1995 to 2002 are shown in Table 5. Inactivity can be illegal: oversight is required and those not fulfilling this requirement break the law.

⁵⁰ Pers. comm., Spanish, 10/17/02.

⁵¹ Pers. comm., Spanish, 10/17/02.

TABLE 5

“Illegal” Actions by Nicaraguan Lumber Sector Actors, 1995-2002
(expanded from Brook 1999)

<i>Actors</i>	<i>Activities</i>
Loggers	Extract without permits Not use directional felling Process commercial planks with a chainsaw instead of a mill
Communal Leaders	Sign permits for personal gain Sell communal land to logging companies
Truckers	Travel at night to reduce risk of being caught with illegal lumber Hide lumber under other products (e.g., rice, beans, corn) Camouflage restricted lumber with other species Use falsified permits to transport wood Re-use the same permit to extract additional lumber
Logging companies and intermediaries	Avoid fees and fines Make ‘arrangements’ with local and municipal officials Use the same extraction permit or transportation guide repeatedly
Municipal governments	Make ‘arrangements’ with companies and intermediaries Charge unregulated transport fees; lumber has highest cost Poor oversight of municipal logging permits
Forest inspectors	Falsify records to show less extraction than occurred Falsify records to reduce amounts transported
Foresters	Inflate numbers in management plans because paid by volume Write plans from the desk without required fieldwork Copy previous plans from the area to save time and effort Not implement INAFOR recommendations
INAFOR	Corruption: falsified records and pay-offs Insufficient monitoring: extraction, transport, and regeneration
Regional government	Not approve forest concessions in plenary as mandated by law Limited oversight of logging companies and intermediaries
Central government	Conflict of interest (e.g., investment in logging companies)

From 1996 to 2002, Chamorro’s successor President Arnoldo Alemán passed numerous degrees targeting the forest sector, but these did not create coherent legislation. He created new institutions but this served to further fragment forest management, which was already spread across various ministries. Rates of deforestation in the late 1990s were even higher than in the early 1990s. Between 1995 and 1999, Nicaragua lost

1,184,000 hectares of forest for an average annual deforestation rate of 296,000 hectares (Roldan 2001). The following sections discuss some of the state policies leading to these high rates.

In 1997, President Alemán wrote a decree banning harvest of three species for five years: pochote (*Bombacopsis quinatum*) and two of the Caribbean's most profitable lumber species, big-leaf mahogany and Spanish cedar. Hearing of the ban, loggers were rumored to have increased extraction. When they transported logs, they claimed that trees had been cut before the moratorium. Since trafficking became illicit, the potential for profit increased and spurred further extraction. A community member noted,

In the midst of the moratorium on cutting precious timber, harvests remained high. What was cut illegally was sold in auction. This was protected by government decree. The government sold to loggers without the permission of the communities.⁵²

Hurricane Mitch hit Nicaragua in 1998 and legislation was passed stating that it was legal to extract any lumber that had been blown down. In the midst of the moratorium on big-leaf mahogany and Spanish cedar, state officials and lumber extractors used Operative Forestry Plan 1998 (POF 98) to continue to extract and transport these species.⁵³ An INAFOR representative noted that in many places, an inventory of trees supposedly damaged by the hurricane was never carried out. According to a RAAN INAFOR official in 2002:

POF was put in place because of the moratorium of Alemán. There was already a lot of lumber cut and left. It had nothing to do with [Hurricane] Mitch...At this time, most extractors would just arrive with list and they would say that they had

⁵² Pers. comm., Spanish, 03/10/02.

⁵³ President Alemán finally admitted that moratorium was not having the desired effect and cancelled it later in 1998. Bans are drastic measures that can have unintended consequences, such as encouraging illegal harvest, over harvesting, and corruption (Tropical Science Center 2000). Bans also foment distrust in the industrial sector because company owners and investors are never certain if their harvesting rights will suddenly be revoked.

more down than they really did. Most trees were not even cut yet, but once paid for, they were cut. Last year, some *madereros* (lumberjacks) were still taking out with POF permissions.⁵⁴

Extractors merely had to approach the state ministry in charge of lumber permits with the quantity of lumber that they claimed was down. Once fees were paid, this lumber was legal, even if it contradicted the moratorium. Fees of four hundred cordobas, or thirty-five dollars, were paid per cubic meter of lumber.

The international reports that I have read, which coincided with information from my interviews with local officials, stated that Hurricane Mitch primarily brought rain to eastern Nicaragua; there was not extensive wind damage. Further proof of the invalidity of this plan was that the vast majority of lumber extracted using this permission process was mahogany. The hurricane could not specifically target mahogany areas because the tree grows in low densities throughout the forest, meaning that if there was wind damage other trees would have fallen as well.

Over subsequent years, extractors used POF 98 permissions to extract wood. In eastern Nicaragua's wet climate, lumber partially rots after one year and, after a second year, extraction generally cannot be justified. A few of my sources suggested to me that the majority of lumber extracted in subsequent years using POF 98 permits was not uprooted by the hurricane, but rather intentionally harvested after permits were purchased.

The administration of the process was poor. Some of the loss for the state was likely to be related to corruption on the part of the officials collecting, although some might also have come from clerical errors. INAFOR studies later showed that incorrect

⁵⁴ Pers. comm., Spanish, 10/22/02.

charges under POF 98 meant a massive loss of income for the state. POF 98 taxes collected between October of 1998 and 2000 totaled 6,235,374 cordobas, but the additional amount that should have been collected was 4,189,963 cordobas (INAFOR 2001b). See Table 6 below for the amounts from each municipality. When the captured and escaped amounts were summed, Prinzapolka had the greatest potential capture and also the most lost. The first four municipalities, all located in the RAAN, had the greatest use of POF 98 permits. Other municipalities generated less than four percent of overall POF 98 fees captured by October of 2000.

TABLE 6

POF 98 Lumber Taxes by Municipality (INAFOR 2001b)

Municipality	Captured (cordobas)	Escaped (cordobas)	Potential Capture (cordobas)
Prinzapolka	1,944,290.79	1,582,605.62	3,526,896.41
Rosita	2,143,547.83	1,185,439.98	3,328,987.81
Siuna	1,312,658.61	905,513.03	2,218,171.64
Puerto Cabezas	620,246.07	466,045.6	1,086,291.67
Matagalpa	169,838.36	48,398.46	218,236.82
Jinotega	44,792.43	1,960.14	46,752.57
TOTAL	6,235,374.09	4,189,962.83	10,425,336.92

The Autonomous Region Plan 2000 (PRA 2000) originated when five RAAN mayors approached INAFOR concerned about illegal lumber that had been harvested. Due to the extreme poverty of the region, they requested a special legalization process. As a result, INAFOR created what many Nicaraguans have described to me as *a devastating policy that was made worse by a series of institutional errors and widespread abuse of power*. After three years, the same mayors requested the cancellation of PRA 2000 permits, but most damage had already been done.

Like POF 98, the majority of PRA 2000 applicants were in the RAAN, as shown in Table 7, although there were small quantities of lumber legalized in the RAAS.

TABLE 7

PRA 2000 Inventories by RAAN Municipality (INAFOR 2001b)

Municipality	Inventory Volume (cubic meters)	Percentage Paid (prior to Aug. 01)
Prinzapolka	14,309.86	33.99
Waspam	11,585.86	12.92
Puerto Cabezas	6,826.28	30.42
Siuna	3,434.27	42.12
Rosita ⁵⁵	3,087.73	8.68
Bonanza	0.00	0.00
Waslala	0.00	0.00
TOTAL	39,243.944	25.87

⁵⁵ Large areas of Rosita were not inventoried.

Table 7 shows that the greatest volumes came from Prinzapolka. In many cases, *the same extractors benefited from PRA 2000 as benefited from the earlier POF 98*. Between October, when PRA 2000 was announced, and December, when an inventory of felled lumber occurred, thousands of cubic meters were cut. According to an INAFOR official, the total original harvested lumber in Prinzapolka was probably around 10,000 cubic meters, but when the inventory was complete, the number was closer to 30,000.⁵⁶ INAFOR officials believe that the actual amount cut across the RAAN before PRA 2000 was 15,000 and that as much as 50,000 was cut by the time of the inventory.⁵⁷ Not all harvested lumber was included in the inventory. Companies and intermediaries had to petition for evaluation and had to be willing to pay to legalize lumber. Some operations chose to continue illegally.

PRA 2000 caused losses of lumber because the transportation capacity was not sufficient (author's fieldnotes). Loggers seized the opportunity to cut, but many trees were left to rot during the rainy season. Some extractors could not pay to legalize the trees and then also cover transportation.

The INAFOR representatives that carried out the inventory were brought in from other regions of the country. Two INAFOR officials I spoke to believed that the state foresters often recorded a higher number of trees in return for payment. Extractors were then able to cut more wood.⁵⁸ This is another example of how *corruption encouraged deforestation and the unsustainable extraction of big-leaf mahogany*.

⁵⁶ Pers. comm., Spanish, 05/29/02.

⁵⁷ Pers. comm., Spanish, 10/22/02.

⁵⁸ Pers. comm., Spanish, 10/22/02 and 12/12/02.

Members of two RAAN villages described to me a lack of respect for local land tenure under PRA 2000 extraction. One leader stated, “They would come in and cut on people’s land without asking for permission, then the trees were auctioned off because they were illegal. With PRA 2000, they would cut illegally and make the process legal by getting small fines paid and taxes paid.”⁵⁹

Nearly all the lumber covered under PRA 2000 was big-leaf mahogany; there were considerably smaller quantities of andiroba. Based on the December 2000 inventories, INAFOR (2001c) estimated that the total number of trees harvested was 17,080, of which 15,698 came from the RAAN and 5,104 came from Prinzapolka. A general approximation of the density of mahogany was one mature tree per hectare. Thus, INAFOR believed that PRA 2000 affected 17,080 hectares of the country.

Due to poor road conditions and the impassability during the heavy rains, INAFOR had to grant a series of extensions for PRA 2000 transportation periods in 2001 and 2002. The first resolution granted until April 30, 2001, but only ten percent of the inventoried lumber was transported to mills by this date (INAFOR 2001c). Extractors did not trust that they would be able to transport all of their lumber before the rain began again and only legalized part of their inventoried wood. Another resolution was passed granting an extension of ninety days, with an end date of August 11, 2001. By this date, approximately twenty-five percent, as shown in Table 7, of the inventoried RAAN lumber had been paid for, but not all of this was transported. INAFOR (2001c) found three primary impediments in Prinzapolka to explain why lumber that had been paid for had not been transported. These included financial constraints, climatic problems

⁵⁹ Pers. comm., Spanish, 03/10/02.

impeding river transport, and land tenure disputes. These same three factors are consistently problems for private extraction in the municipality. They will also create challenges for the development cases covered in later chapters.

The first PRA 2000 extension included a statement that there would be no more extensions, but since the numbers were so low, another extension was granted in March of 2002. It established the final date for transporting PRA 2000 lumber that had already been paid for as May 31, 2002. However, due to heavy rains, a new resolution was passed on May 31st acknowledging that the beneficiaries of PRA 2000 had still not been able to transport their legalized wood in the timeframe granted. This resolution authorized them to transport the wood “in the time that it is possible for them to do it, in conformity with the existing climate conditions and their own operational capacity.”

In 2002, a former INAFOR forester who was involved with the original creation of the plan stated that originally, “INAFOR created a technically sound proposal for PRA 2000, but lots of parts were cut. There are people with economic power, who have influence. Eighty percent of the wood that is being taken out now using this loophole is new wood.”⁶⁰ He suggested that the private sector had lobbied aggressively for changes to PRA 2000 that created this legal loophole. He was also concerned that the last PRA 2000 extension in 2002 had no specific completion date.

The last method used in the 1990s to control extraction of species that were under severe pressure for extraction was to increase fees and introduce special taxes. President Alemán employed this tactic in August of 1999, when a degree established a special fee of 7.5 percent to be added to each cubic meter of big-leaf mahogany and Spanish cedar

⁶⁰ Pers. comm., Spanish, 06/14/02.

logs. The fee was aimed at providing economic disincentive to the extraction of these two species, but it also raised money for the state. The private Forest Chamber was heavily opposed to the fee and lobbied to have it removed. The fee did become temporary, as it was not employed during PRA 2000; however, similar fees were later employed. In October of 2001, the Law of Harvesting and Forestry Service Rates established different fees for different categories of wood. Precious lumbers in danger of unsustainable extraction, such as big-leaf mahogany, fell in category A. The fee was two hundred fifty cordobas per cubic meter of unprocessed trunks. The next three categories rated species in terms of abundance and value, and established cascading fees accordingly. Given the tendency for illegality in the Nicaraguan forest sector, it is probable that these fees encouraged extractors to avoid declaring lumber to evade payment, or to making special arrangements with officials.

The above paragraphs demonstrate that Nicaraguan forest policy was ineffective and that there were institutional weaknesses leading to poor implementation. It is important to note that various sectors and levels of government were involved in these processes. The RAAN was a hotbed for the problems noted above. Indigenous villages, and their communal forests, were heavily exploited in the 1990s. By most reports, big-leaf mahogany made up the greatest volume of lumber from the region.

A limited number of different species were extracted from Nicaragua throughout the 1990s. In 1995, thirty-eight different species were exported to twenty-two countries. Although the number of exported species seems high, there was limited diversification. Ninety-five percent of the total volume exported was made up of just a few species. It was dominated by the pine family, which nearly made up fifty percent. The majority of

pine originated from the Pacific region. Three other important species were big-leaf mahogany (22.38%), Spanish cedar (11.42%), and andiroba (7.40%). These species originated largely from the Atlantic region.

In 1999, there were 109 wood industries in Nicaragua, with seventy-five permanent sawmills and twenty-seven portable mills.⁶¹ The installed processing capacity was more than two thousand cubic meters per day. In 1999, there were 148 Annual Operative Plans and sixty-nine of these were located in the Atlantic Autonomous Region. Fifty-six were located in the RAAN: fifty-four of these were in broadleaf forests and two were in conifer forests. During the late 1990s, there were fourteen documented mills in the RAAN, but there were an estimated forty more mobile mills that were not legally registered (CGR n.d.). These statistics show that legal and illegal extraction were both particularly concentrated in the RAAN.

In the 1990s, mahogany harvesting practices intensified. Even trees previously considered too large were cut. Trees larger than seventy centimeters in diameter frequently decay from the core outward, causing a hollow truck. Whereas in earlier periods of mahogany logging, large trees were left to produce and disseminate seeds, in part because they were hard to extract and transport. More recently, these trees were cut as loggers hoped that portions would be salvageable (author's fieldnotes).

Given the high value of mahogany, there was a surprising amount of waste during harvest and extraction. Waste was documented by Bell (1989/1899) in mahogany extraction in the previous century. Later, Lamb (1948, 1960) also noted that as much as fifty percent of the lumber from trees was often lost. Vandermeer and Perfecto (2002)

⁶¹ Ministry of Agriculture, Forests and Livestock, <http://www.magfor.gob.ni>, accessed 09/01/04.

estimate losses from felled trees remain as high as sixty percent, with only forty percent of the tree being utilized. Due to heavy rains paralyzing machinery, trees were often abandoned to rot for a season before they could be extracted: only the less valuable heart of the trunk can later be salvaged. Loggers cut the trees above the buttress to save time and fuel in the felling of the tree, which entails a substantial loss of timber (Weaver and Sabido 1997). In spite of technological advances, large volumes continued to be lost in the act of squaring the logs with poor equipment. The mills generally used old circular or band saws that cut inefficiently and irregularly. Although by law, planks should not be cut using a chain saw because of the large waste, in Prinzapolka during 2002 and 2003; this was still generally the practice when processing mahogany (author's fieldnotes).

When fluvial transportation is used, as it generally is in Prinzapolka, logs are stored on the banks of rivers until the water levels rise high enough to float them. This practice involves risk in both dry and wet years. During dry years, the water level may not rise sufficiently and the lumber could be stranded. If floods occurred, the logs could be lost, scattered, or damaged. Historically, the lumber was then generally transported by sea, but sand often prevented entrance of larger boats to the mouth of rivers. During the transportation by small vessels or rafts to ships located a few miles off the coast, much lumber was lost.

The following sections examine major logging companies working in the RAAN during the 1990s. This analysis of commercial processes helps set the stage for the later entrance of development projects. As many of the international initiatives described in Chapters Six and Seven were based on commerce, the following discussion demonstrates some of the challenges that they would face while initiating operations.

Three companies, *Maderas y Derivados de Nicaragua*, S.A. (MADENSA), *Sol del Caribe* S.A. (SOLCARSA), and PRADA, S.A., particularly impacted Prinzapolka. MADENSA harvested most of the mahogany from the upper river, SOLCARSA built a major logging road into the municipality, and PRADA purchased a lumber for its plywood factory throughout the zone. These transnational companies received international investment. Their operations faced setbacks as a result of the lack of legal clarity over land tenure.

Maderas y Derivados de Nicaragua, S.A.

MADENSA was formally initiated in 1991 with shared financing from investors in the Dominican Republic and Nicaragua. Prior to 1990s, the principal Nicaraguan investors in the company, Hormigones Moya, purchased wood in the Wangki River area (CGR n.d.). In September of 1990, the consulting agency EUROCONSUL was hired to do a feasibility study on forest extraction in the RAAN and, based on its positive results, the company decided to build their main plant and offices in Bilwi.

In 1991, MADENSA signed an agreement with the Sumu-Mayangna village of Awas Tingni. Since the community was inexperienced, they granted rights to MADENSA for twenty-five years, but after they saw the impact that the company was having, they wished to reduce this term (Castillo 2002). In the meantime, in December of 1993, the Chamorro government granted 42,000 hectares of forest land claimed by Awas Tingni in concession to MADENSA (Wiggins 2002). Although seemingly large, studies later showed that MADENSA needed 72,000 hectares to match their investment plan (De Camino 1997).

In a community assembly, Awas Tingni decided that they wanted to reduce MADENSA's permission to five years. They received help from S. James Anaya, Esq. an indigenous lawyer from the United States. In May of 1994, a tripartite agreement was negotiated between the Nicaraguan state, MADENSA, and community representatives (Anaya and Crider 1996). This was the first such agreement in the region and intended to guarantee strict environmental norms and respect for indigenous rights (Anaya 2002).

According to the company manager in Bilwi, MADENSA extracted a documented 16,788 cubic meters of roundwood from the area before the agreement fell apart because of a land tenure dispute with the state over another logging concession for the company SOLCARSA.⁶² MADENSA's extraction focused primarily on three species: big-leaf mahogany, Spanish cedar, and andiroba. These species made up sixty-two percent of the harvest under the company's 1996 annual operative plan (De Camino 1997).

There was little economic benefit or community development documented in Awas Tingni as a result of the years that MADENSA worked there (CGR n.d.), although the company purchased lumber from individuals who received income. MADENSA did not follow through with silvicultural treatments after extraction. During the later years of harvest, MADENSA improved their methods, although there were still differences between their management plan and their actual activities (De Camino 1997). In the late 1990s, MADENSA personnel received international technical support and training from CATIE, a Costa Rican technological organization, and established permanent research parcels (Taylor 2000).

⁶² Pers. comm., Spanish, 06/27/00.

MADENSA began extraction in Alamikangban in 1992 and worked there until 1998, purchasing lumber from the entire upper Prinzapolka River area (author's fieldnotes). A former Alamikangban sindiko recalls,

I talked to the community and they wanted a wood company to come. I went to MADENSA in [Bilwi] and they said yes. They wanted to come. The company wanted one thousand cubic meters and the governor gave permission for 1,240 cubic meters. MADENSA gave me twenty thousand cordobas for the deal and I bought food and came back and gave it to the community. The company came and began to cut wood.⁶³

MADENSA assisted local groups by bringing in chainsaws and providing money and food for mahogany hunters and extractors who would spend a month in the forest at a time. According to a logger who worked for the company in this period, MADENSA field managers gave 1,500 cordobas to groups of three people for supplies. The company lent each group a chainsaw. In Alamikangban, there were about ten groups. They went to the forests for a month to six weeks and floated the harvested lumber down the river. According to a local logger, when they returned to Alamikangban, each group had about forty trees and would be paid three thousand cordobas.⁶⁴ An elder in a neighboring community recalls that in the time of MADENSA, there were about fifty village men working. He could not state precisely how much lumber was taken in total because they logged in small teams and each one did not know what the others cut.⁶⁵

This type of employment arrangement allowed the company to avoid any direct obligation to its workers because they were under the supervision of village contractors (Hale et al. 1998). In spite of seasonal lows, when the company was not able to get

⁶³ Pers. comm., Spanish, 09/19/02.

⁶⁴ Pers. comm., Spanish, 10/21/03.

⁶⁵ Pers. comm., Spanish, 03/30/03.

primary materials, MADENSA dominated the national forestry sector. In 1992, the company exported seventeen percent of Nicaragua's total forestry exports and in 1994, the percentage rose to thirty-five (Shi6n and Ambrogi 1997).

After extracting the most valuable mahogany from Prinzapolka, the company pulled out in the late 1990s. The remaining lumber was too expensive due to the high costs of extraction from the remote municipality. In addition, there was conflict with local populations. MADENSA's former field manager in Alamikangban recalls that the company would sometimes pay loggers prior to extraction, only to find later that they had sold the lumber to another buyer.⁶⁶ Moreover, the area was still considered violent due to the recent demobilization of resistance combatants. In 1993, Alamikangban villagers protested against MADENSA due to the destruction of the village street by machinery piling, loading, and transporting the mahogany. A community member recalls:

We did not have problems with MADENSA except once when they were taking out a lot of trees and left the center of town like *wabul* (porridge) from all the trips they made with the trucks. It was like a swamp and people rose up and said that they had to repair it.⁶⁷

MADENSA continued purchasing lumber from across the RAAN. Although it experienced a slight setback in 1998 due a suspicious fire in its Bilwi mill, the company recovered (CGR n.d.). According to the Bilwi MADENSA manager in 2000, the company had one hundred direct employees in administration, production, and milling, as well as fifty indirect employees in the forest.⁶⁸ They primarily sold to Managua, the Caribbean, and the United States. Nicaraguan political support and investment

⁶⁶ Pers. comm., Spanish, 11/27/03.

⁶⁷ Pers. comm., Miskitu, 06/25/03.

⁶⁸ Pers. comm., Spanish, 06/27/00.

partnerships with important political figures made the company representatives feel above the law, especially in reference to mandates from regional or local institutions. In 2001, the president of the RAAN regional council's environmental commission described high-level MADENSA operators as "arrogant" and not interested in legal channels.⁶⁹

Another area of concern was MADENSA's treatment of workers. Union representatives noted in 2002 interviews that when workers had an accident or were sick, MADENSA administrators said that they did not have money to help.⁷⁰ The protective gear worn was disposable and would tear, but when workers asked for replacements, they were refused. Workers used a liquid to treat the wood that they believed created respiratory and digestive side effects. They also attested to verbal abuse. Mistreatment and humiliation of new workers was common, but experienced workers were only treated slightly better. Any worker that arrived late, even a few minutes, lost a day's pay.

In 2001 and 2002, MADENSA continued to purchase lumber through intermediaries in Prinzapolka. MADEFOR, a second company on the same MADENSA site in Bilwi, opened for processing into wood molding and paneling. The companies produced parquet from species such as Santa María (*Calophyllum brasiliense*), nancitón (*Hyeronima alchorneoides*), guapinol (*Hymenaea courbaril*), and cortez (*Tabebuia guayacan*) that were not demanded by the world market. This affected the financial liquidity of the company. Since MADENSA could not pay truckers upon delivery of wood, they eventually stopped transporting to the mill. In early 2003, when the sindiko of Alamikangban approached MADENSA about purchasing mahogany and other precious

⁶⁹ Pers. comm., Spanish, 07/02/01.

⁷⁰ Pers. comm., Spanish, 04/06/02.

woods, the company was interested, but could not pay even a percentage in advance. The *sindiko* considered the risk too high. At the time of fieldwork, MADENSA maintained its offices in Managua and Bilwi and exported shipments from its warehouse when it could find a good price, but was not processing new lumber.

This discussion of MADENSA highlighted the limited and short-term benefit for indigenous villages from lumber extraction. The entrance of foreign advocates (in this case, lawyers for Awas Tingni) to begin to assist in the protection of local rights is also apparent. In the end, MADENSA's production, like many logging companies in the region, was interrupted as a result of tenure conflicts, legal and administrative battles, and economic hardship. Legal assistance because of land tenure conflicts was also required in the following case and continues to the present in July, 2003, although the transnational logging company SOLCARSA no longer exists.

Sol del Caribe S.A.

Sol del Caribe S.A. (SOLCARSA), a subsidiary of the Korean company KumKyung, was created in 1995 and their first Nicaraguan wood mill was built in an indigenous village of the RAAN. SOLCARSA later abandoned this mill, and even lumber that was stored there, in 1997. In requesting the transfer from the Ministry of Environment and Natural Resources (MARENA) in May of 1997, the company cited land conflicts between the neighboring villages as a principal reason. Other factors included damage to equipment due to the salinity present and the high costs of transportation from the areas of harvest to the mill (CGR n.d.).

In 1996, the Chamorro government granted SOLCARSA a thirty-year, 62,000 hectare concession in primarily old growth rainforest. The area intercepted the communal

land claimed by a Sumu-Mayangna community called Awas Tingni, located in the municipality of Waspám (Anaya and Crider 1996). Awas Tingni began to protest the concession and brought several unsuccessful cases to national courts. The first case was filed on September 11, 1995 against MARENA for undertaking negotiations with SOLCARSA without the participation of the community (Acosta 1996). The community filed for legal protection based on imminent danger to their survival. The court decided that they had filed too late because they had taken more than thirty days. Awas Tingni then filed in the Court of Appeals in Matagalpa on November 7, 1997, as there was not RAAN court at this point in time. This case was placed against national and regional state officials. When this case was rejected because of a technicality, Awas Tingni filed the same suit in the Supreme Court. The national case was also rejected, a year and a half later, with no reason given.

Awas Tingni tried to get their land titled throughout the permitting process of SOLCARSA. International allies worked to document historical claim and the community gained a strong legal team in the autonomous region and the U.S. In 1994, they used money and technical advice from WWF to carry out a study of their lands. They mapped the area using GPS and sent the coordinates to Harvard University where a computer-generated map was produced (Preston 1996). The community later spent several weeks working with an anthropologist from Cultural Survival to record oral history, community structure, and past and present land use patterns. On a separate occasion, a GIS team from the University of Iowa documented that a ninety thousand hectare land area traditionally belonged to Awas Tingni. S. James Anaya, Esq., from the

University of Iowa, heads an interdisciplinary support team, the Awas Tingni Resource Development Support Project.

In 1995, Awas Tingni petitioned the Inter-American Commission for Human Rights (IACHR) of the Organization of American States (OAS), accusing the Nicaraguan government of violating their territorial rights (Acosta 1996).⁷¹ The community asked the commission to intercede on their behalf by requiring dialogue between the government of Nicaragua and the community. Their hope was that a process would be established for the recognition of all of the indigenous territorial rights in the region.

The IACHR Commission supported dialogue. The Chamorro government agreed to a process of friendly settlements, but negotiations were not successful (Anaya 1997). While the petitioners and state representatives met three times, little progress was made. In October of 1996, Chamorro began a National Commission for the Demarcation of Communal Lands, but within two months the indigenous organizations and leaders withdrew. They felt that the state controlled the process in order to protect its interests. The World Bank withdrew funding and the process came to a halt.

Based on the request of the community, two RAAN regional councilors took a case to the Nicaraguan Supreme Court (Brook 1999). It was decided in February of 1997 that the concession was unconstitutional because SOLCARSA's approval had not passed in front of the whole RAAN regional council; rather, it was decided only by the board of directors. The judge ordered the concession to be annulled. Instead, the environmental

⁷¹ In 1991 Nicaragua accepted the jurisdiction of the Inter-American Court. The Nicaraguan constitution recognizes the state's obligation to uphold the American Convention on Human Rights. Awas Tingni's case was supported by a 1983 IACHR report that recommended that the Nicaraguan government clarify the land tenure of indigenous groups (Anaya 1997).

minister directed a letter to the RAAN Council President soliciting the legal approval of the concession. The SOLCARSA case returned to the Supreme Court. The court ordered President Alemán to force state ministries to annul the concession. A request for the company to stop all activity was sent (MARENA 1998).

Not all Nicaraguans wanted to accept the Supreme Court's decision, but it became irrelevant since KumKyung had declared bankruptcy in November of 1997 after the Korean economy destabilized (Duarte 1998). Studies also showed that SOLCARSA would have needed a concession of three hundred thousand hectares to cover their investment plan (De Camino 1997). As a small country with poor infrastructure, Nicaragua had problems supplying the scale of operation at which large transnational lumber companies work. SOLCARSA terminated operations in the RAAN. While the company functioned, it created several conflicts due to cutting trees in communal areas outside its concession, installing a processing plant without the corresponding environmental permits, breaking its lumber purchasing agreements with indigenous communities, and violating technical norms and the standing forestry legislation (CGR n.d.).

On August 31, 2001, the IACHR court handed down a sentence in favor of the Awas Tingni in the case they had placed against the Nicaraguan government. According to Anaya (2002), the court found that two articles of the American Convention were violated. Article 25 says that states must protect human rights based on national law, which in this case included the Autonomy Statute. The court stated that the Nicaraguan government should have titled the land. Article 21 protects the right to property. It was decided to include collective property based on indigenous customs even though Awas

Tingni did not have a title. Awas Tingni's OAS case set an important precedent for indigenous communities across the Latin American community by recognizing communal land as a human right. The OAS Commission found that the Nicaraguan government violated several international legal obligations, including the community's right to protection under the law because national courts did not act expeditiously.

Although the international case would seem to resolve conflict surrounding this case, in reality, it was just the beginning. According to a legal representative of Awas Tingni, there have been contradictory perspectives between the village's lawyers and state representatives on the process of demarcation.⁷² Moreover, *saneamiento*, or clearing of other land claims, is required and there has been conflict between the historical use by Awas Tingni and the more recent possession of Miskitu villages in Tasba Raya. The six indigenous villages of Tasba Raya were settled thirty-five years ago with French assistance.

Illegal logging and conflicts over lumber in the area have only served to heat up this debate. The OAS gave the state fifteen months to title the lands of Awas Tingni and pay compensation, but this deadline was not met. Nicaraguans and international observers were beginning to realize how difficult it will be to demarcate and title lands in the RAAN after decades, and in some cases centuries, of overlapping claims.

PRADA, S. A.

The logging company PRADA, S. A. was founded just weeks after SOLCARSA was ordered to stop their activities (Brook 1999). In 1997, SOLCARSA built a large plywood plant in a second indigenous community located less than thirty kilometers from

⁷² Pers. comm., Spanish, 06/13/02.

Alamikangban. With Korean financial support, Nicaraguan construction and roofing supply giant, Pedro Blandon Moreno, initiated PRADA and purchased SOLCARSA's mills and machinery in March of 1998.

When Moreno took charge of PRADA, he sued officials in the Ministry of Environment and Natural Resources for not completing PRADA's permitting process more quickly, in spite of the fact that not all forms had been filed. He also sued representatives of an outspoken Nicaraguan environmental organization, the Humboldt Center, for slander when they publicly denounced the company for working illegally (Brook 1999).

PRADA, with Moreno as president, remained a hegemonic corporate power in the region and even at a national level until the time of writing in 2005. Moreno provided financial support to other RAAN-based timber extraction companies. These partners provide PRADA's mill with trees at the lowest prices. Lumber was often purchased from indigenous villages, which repeatedly created conflict. Local populations were dissatisfied by prices, frequent delays in settling accounts, and payment in products from Moreno's stores, such as roofing materials or sacks of rice and beans, instead of cash. There are many different wood options when making plywood and the company was able to select species and villages to keep their expenses low. Since there was little competition with other companies for species other than big-leaf mahogany and Spanish cedar, PRADA could offer low prices and still find enough supply (author's fieldnotes).

Company representatives had conflict with regional and municipal officials on various occasions. During 2000 and 2001, PRADA had problems with environmental commission of the RAAN council because the company was working with expired

permits.⁷³ PRADA representatives claimed that they were merely transporting trees that had already been felled, but state officials believed that they were cutting new trees. In 2001, the Siuna municipal government attempted a lawsuit because PRADA cut trees below the minimum legal size. In 2002, INAFOR fined the company \$35,000 for harvesting on indigenous land outside its approved concession areas. These are just a few examples.

PRADA was also active in land sales. Rumors in the logging industry were that more profit was made from real estate than from timber. Newly purchased land plots were logged and then sold at a profit as cattle ranches as the agricultural frontier progressed eastward. According to a RAAN councilor, the company's buying and selling of land caused conflict, especially with insecure communal tenure and shady legal transactions regarding land throughout the RAAN.⁷⁴

At the same time, PRADA's plywood plant had low earnings: it did not function to capacity and experienced temporary shortages of wood when roads were impassable due to heavy rain. Guatemalan partners, who had purchased Korean shares, finally found investment too risky and backed out of the company in 2003. PRADA was forced to let workers go and reduce financing to extraction partners. Nonetheless, PRADA has continued. In Chapter Seven, I describe how certified wood provided the company with new market opportunities.

LOGGING IN PRINZAPOLKA

The remainder of this chapter discusses logging in Prinzapolka in 2002 and 2003.

⁷³ Pers. comm., Spanish, 07/06/00 and 07/02/01.

⁷⁴ Pers. comm., Spanish, 07/10/01.

It highlights the role of local populations, lumber intermediaries, and domestic logging companies. The chapter ends with a discussion of land tenure insecurity in Prinzapolka, which is a major impediment to establishing a sustainable forest management regime.

My surveys in fifty Alamikangban households in October of 2002 demonstrated high communal land use, as shown in Table 8 below. The table also exhibits multiple uses in most families, including commercial and subsistence logging. There were eight important uses of communal land in 92-100 percent of households.

TABLE 8

Communal Land Use by Household, Alamikangban, 2002

Land Use	Yes Responses
Cultivate	100%
Fish	100%
Gather firewood	100%
Hunt (for personal consumption and sale)	98%
Log wood to sell	96%
Gather fruits, plants, and medicines	96%
Capture birds or animals to sell	96%
As a place for “taking care of plants and animals” ⁷⁵	92%
Spiritual or ceremonial activities	6%

⁷⁵ There is not an exact word for conservation in Miskitu.

The forest is an important part of the livelihood of the Miskitu in Prinzapolka. Forest use is intricately woven with cultural practices, whether it involves “traditional” practices, such as hunting and gathering or extraction for lumber companies.

According to inhabitants of Alamikangban, the town center was filled with as many as ten thousand beams during peak months of the year during the 1990s. In 2002, a logger explained:

Before we took out more lumber. It was under MADENSA and other large companies. They had the management plan and most lumber was cut legally. People were paid by the company to go and extract and bring the trees to them. Now, logging is illegal and there is no funding. Loggers have to pay for the whole process. They go out for about ten days and mark all the trees that they find that are not already marked. Then, they return and go from shop to shop looking for finance for food and other supplies that they will need to go do the work and bring in the trees.⁷⁶

When large companies departed mahogany trade continued, but it had changed.

Local loggers increasingly worked through intermediaries. Sometimes a sale was arranged prior to harvest, but often they had to wait for a buyer. Loggers had to use their own funds, and costs were higher because the mahogany was located in less accessible areas.⁷⁷ People had become accustomed to the income. As one logger stated, “We are going to keep cutting because there is no other work and the agricultural harvests are not like they were before.”⁷⁸

In 2002, mahogany logs were floated down the river tied together into huge rafts, as shown in a photograph in Appendix Five. Trunks are squared into “timber” with a chainsaw either at the waterfront or before transportation. When lumber was extracted

⁷⁶ Pers. comm., Spanish, 05/02/02.

⁷⁷ For a discussion of how risk is transferred to primary producers in the logging sector see Sierra and Stallings (1998).

⁷⁸ Pers. comm., Miskitu, 10/17/02.

legally, the National Forest Institute inspector would adjust the fee upward to cover the wood discarded. Local populations complained about this practice because they did not sell the curved edges. Timber was often sawed into boards on Alamikangban's waterfront. This practice was illegal because of the huge waste caused by the thick chain of the saw, but boards received a slightly higher price than timber so community members with access to a saw and fuel cut them. On clear days, I recall a nearly constant chainsaw growl either at the wharf or clearing agricultural fields on the edge of town.

Concentration on one species, big-leaf mahogany, lowered the number of standing trees and could impact future regeneration. According to my sources, trees were being cut smaller than ever before. The smallest tree I measured in Alamikangban in 2002 was twenty-seven centimeters. The legal minimum was forty-five centimeters and most companies with management plans only harvested trees that were fifty to sixty centimeters and up. U.S. companies working in the area in previous decades strictly enforced a twenty-inch minimum diameter rule, which village elders could still repeat in English in 2002. The companies also left the oldest trees, which often had a hollow trunk and were difficult to transport. There has been natural regeneration of mahogany since extraction ended in the 1960s and 1970s. Since older Miskitu villagers have seen the mahogany regenerate in their lifetime, there is a general assumption that it will occur again. However, in 2002, mestizo colonists were harvesting even the smallest trees, as shown in the photograph in Appendix Five called "ten-inch mahogany."

Whether loggers or not, villagers are aware of the local role in deforestation. In a 2002 survey I administered in Alamikangban, *ninety-six percent thought that townspeople were not managing their common-property forests well. Ninety-four percent*

of the population also thought that the mayor was not managing forests well and ninety percent thought the same about their village sindiko. The decision making processes of these officials are discussed in more detail in the following chapter.

Community members admit that they were anxious to extract lumber because they were uncertain when buyers would return or if their land claims would be challenged. Yet, some believed that there should be greater communal benefit from harvest.

We want funds from forest extraction to go to social works and local employment. No one helps in the community. We know that this lumber is exported for a lot of money, and yet we are paid so poorly here. Money from extraction should come to the community to help with housing and assist orphans and widows. Now we are not getting benefit. If a company is going to come to work here, they better have enough funds to attend to the community. You need to have capital to work here. For this reason, we want to have the big foreign companies.⁷⁹

Another community member disagreed: “We do not want to sell to the big plywood company because they are destroying the forest and they pay a low price.”⁸⁰ A villager complained:

INAFOR does not give permission for extraction to people of the communities; they just give it to logging companies... We have no other options. It is a double-edged sword: we need to support our families, but we are losing the forests... The problem is that there is extreme poverty. The companies come in with money and buy people off. They weaken our form of organization and they cause divisions in the communities. We need to start a campaign to increase consciousness in our villages.⁸¹

A village member admitted, “We have not taken any local measures to stop illegal logging – what can we do? Wood trafficking in this area is worse than drug trafficking. It works like a mafia.” During fieldwork, illegal lumber harvest was done by only part of the economically active male population. It is notable that some of these individuals are

⁷⁹ Pers. comm., Spanish, 10/17/02.

⁸⁰ Pers. comm., Miskitu, 10/17/02.

⁸¹ Pers. comm., Spanish, 03/05/02.

past or present village leaders, precisely those elected to have the responsibility of overseeing communal resources. Others have connections to the past or present municipal government.

After a decade of heavy harvests, one leader was completely against all logging, “I would like it if there wasn’t any more wood taken. We should publish that companies should not even come here because nothing more is leaving.”⁸² Another leader disagrees, “If we stop cutting wood completely, then we will all have to walk around as thieves assaulting trucks because there are no other options.”⁸³ An Alamikangban pastor acknowledged, “We are like prostitutes, but here with wood instead of sex.”⁸⁴

Local populations felt disempowered by forest management decisions. One villager stated, “We still have ‘red’ wood [mahogany and Spanish cedar], but INAFOR will not give us permits for it.”⁸⁵ Explaining state policies to Alamikangban loggers, an INAFOR delegate stated:

If you have a general forest management plan and there is enough mahogany within the specified area to assure regeneration, than we will still permit its harvest along with other species. You can’t only cut mahogany anymore. You have twenty-five species that could be harvested, but now you are only cutting mahogany. You are going to be left with only the bones. Who is going to come all this way to buy only ‘white’ wood⁸⁶ when that is all that remains?⁸⁷

Nevertheless, many *indigenous representatives felt that they should be making decisions about their forest resources, and not state officials or company representatives.* Often they are altogether excluded. One man stated, after observing a regional forestry

⁸² Pers. comm., Spanish, 05/12/02.

⁸³ Pers. comm., Spanish and Miskitu mixed, 05/12/02.

⁸⁴ Pers. comm., Spanish, 05/12/02.

⁸⁵ Pers. comm., Spanish, 10/17/02.

⁸⁶ In Nicaragua, nearly everything other than mahogany or Spanish cedar is considered ‘white’ wood.

⁸⁷ Pers. comm., Spanish, 10/17/02.

meeting, “Our leaders are out hunting and fishing and here people are deciding about their natural resources.”⁸⁸

The following three summaries of logging operations in three villages in Prinzapolka show the complexity of recent conflict among villages, lumber intermediaries, and national logging companies. Tungla was a site for uncontrolled mahogany logging. La Palmera is a trafficking and processing point for illegal mahogany. On the outskirts of Alamikangban, in the plains called El Limón, there was considerable conflict over commercial pine lumber extraction. These locations can be found in Map 2, which demonstrates the locations and spatial scale of case studies. Tungla, La Palmera, and El Limón are listed under additional logging sites. These cases demonstrate a vast range of legal and ethical problems associated with logging from communal land.

A national logging company called Las Minas signed an agreement in 1999 with members of Tungla. The management plan covered 4,385 hectares of the 28,000 claimed by the village. In 2000, the company harvested, but they did not follow their management plan. According to a community elder, the company took out more than fifty trucks of mahogany.⁸⁹ An internal INAFOR report confirms this: 2,956 big-leaf mahogany and 158 Spanish cedar trees were cut illegally.⁹⁰ When INAFOR put a stop to the extraction, the trees were left to decompose. In 2001, different lumber intermediaries cut more mahogany, using the same plan. The village sindiko noted in 2002 that, “The community has been humiliated by the process. They cut all the precious lumber and left.”⁹¹

⁸⁸ Pers. comm., Miskitu, 12/12/02.

⁸⁹ Pers. comm., Miskitu, 02/21/03.

⁹⁰ According to INAFOR records, the biggest tree recorded was fifteen meters long and had a diameter of 147 centimeters!

⁹¹ Pers. comm., Spanish, 09/17/02.

In 2002, Petrona Boudier, a U.S. citizen who emigrated from Nicaragua, purchased the forest management plan, which was valid for ten years. Some community members were unhappy about this sale: “We are the owners of the land. How can the plan be sold to another without our consent? If we made a plan with the company, and the company pulls out, the plan should be ours.”⁹² Another stated, “We have been living there for sixty or seventy years—fifty years ago, the Boudier woman left.”⁹³ The conflict is made worse by an argument in the Boudier family. Joseph Agosto Boudier, who moved to Managua decades ago, holds the title to the land. Tungla is one of a few villages in Prinzapolka that the communal land title was made out in the name of an individual and has passed through a family inheritance. Joseph’s sister, Petrona, wanted to enter to cut wood without his support.

For a period, INAFOR was unwilling to approve Petrona Boudier’s extraction in the area due to the tenure conflict, but eventually they approved an annual plan for 1,042 cubic meters. As this extraction was scheduled to begin, Tungla entered another conflict due to the questionable entrance of a new *sindiko*, who no longer lived in the village. Elders told me that he had falsified signatures of villagers and was granted legal status from municipal and regional institutions.⁹⁴ In 2003, after this individual was legitimized by the state, community members were uncertain how to remove him from power. The pattern of people emigrating from rural areas and later impacting development in their former village, sometimes against the will of the remaining population, is a trend in the RAAN. At the end of fieldwork, it was unclear whether extraction from Tungla would be

⁹² Pers. comm., Spanish, 09/17/02.

⁹³ Pers. comm., Miskitu, 02/21/03.

⁹⁴ Pers. comm., Spanish, 08/24/03.

reinitiated based on the 2000 forest management plan. What is most clear about this case is the lack of local control over decision making in forestry activities.

La Palmera is a mestizo village on the entrance road to Alamikangban; its location is shown in Map 2. The original land title was granted as a private farm. At the time of the fieldwork, intermediaries transferred illegal mahogany through the village. Jorge Francis ran a small concession and mobile mill called El Arbolito from the late 1990s until 2003, when he moved his operation to an area with denser forests. Although Francis had a legal forest management plan for extraction, most of the lumber processed through the mill was extracted illegally from surrounding indigenous land. Truckloads of roundwood and timber were trucked to La Palmera after being floated down the Prinzapolka River. Although Francis burned bark, scraps, and sawdust, possibly to hide evidence of illegal mahogany processing, INAFOR was aware of his illicit activities. At one point in 2002, he was fined for illegal activities and at other points, INAFOR threatened to shut down his operation. Nonetheless, the Prinzapolka INAFOR representative admitted that the institution did not have the material or human resources to monitor or control Francis' activities.⁹⁵ People in Alamikangban believed that INAFOR also lacked the political will. Notably, Francis was considered dangerous. His shooting of an acquaintance in 2002 was reported in the press as a rifle-loading accident, but people gossiped that it was murder.

The municipal government was also aware of Francis' illegal activities, but did little to stop him. Taxes were paid directly to the mayor in 2001 and 2002 when most of

⁹⁵ Pers. comm., Spanish, 05/09/02.

the illegal extraction occurred. In 2002, the municipal lumber inspector stated that Francis:

[C]urrently has wood upriver and is extracting. In the last year and a half, he has never paid taxes. When approached, he says that he has an arrangement with the mayor. When I asked the mayor, he just says keep tally of how much [Francis] is taking...I am going to ask the mayor what is the arrangement because no one here knows. [Francis] is also taking out from other areas...but because I am here in Alamikangban, there is no way for me to measure or charge for this wood.⁹⁶

According to the inspector, another logger, Elwin Hernandez, also had an arrangement with the mayor in 2003. In 1999 when Managua resident Hernandez invested in his forest management plan for the Alamikangban's pine plains called El Limón, shown on Map 2, he envisioned himself earning money and being able to assist the people of the village at the same time.⁹⁷ Instead, he went increasingly into debt and became cynical about local groups and state forest administration. He regrets starting in the logging business: "All the friends that I studied with now have Master's degrees. They ask me what I am doing now and are surprised that I am still doing the same thing, and struggling with debt."

Hernandez remembers that when he first stayed in Alamikangban, people came and robbed him at gunpoint. This was only the beginning of his problems. When Hernandez signed a contract with the sindiko Rogelio Torres, they agreed to have a village member oversee extraction from the logging camp. According to Hernandez, this person came for five days and then got drunk and left.⁹⁸ Villagers later accused Hernandez of over-extracting.

⁹⁶ Pers. comm., Spanish, 10/09/02.

⁹⁷ Pers. comm., Spanish, 09/23/02.

⁹⁸ Pers. comm., Spanish, 07/07/01.

Hernandez had promised to hire Alamikangban workers. In spite of the fact that he was paying \$140 per month, which was considered a good salary in this area, the men who came only lasted a couple days and then left. Hernandez then brought people from the Pacific, which he was harshly criticized for. The only steady employee from Alamikangban in the logging camp in 2002 and 2003 was a young woman who worked in the kitchen. Sindiko Rogelio Torres remembers:

[Hernandez] had a management plan with all the papers. We had an agreement that he would fix the road and repair the launch for the community. It was signed with a lawyer...The agreement was...that fifty percent would be for the community and fifty percent for the company...When I left, [Hernandez] took 20,000 cordobas from the bank account and gave it to the new sindiko. The new [sindiko] board divided it amongst themselves.⁹⁹

When Torres decided to run for mayor, he needed to step down. His vice-sindiko, James Rogers, took his place. Hernandez recalls that he paid stumpage fees to Rogers, who still denounced him for lack of payment. Public protests against Hernandez ensued and townspeople threatened to throw him off their land. Although state authorities stepped in and the fervor quieted, some villagers continued to be against Hernandez and his lumber operation. The sindiko, Hernandez noted:

[i]s astute and manipulative. He is very experienced at calculating lumber and just looks at a tree or a stack and knows exactly how much there is. People here know how to calculate. If they had schooling, they would almost be dangerous. They are very smart.¹⁰⁰

In the first years working near Alamikangban, Hernandez was making money because he was selling whole trees for electrical posts; there was no processing and the price was high. Later, Hernandez recalled that the market shifted. He began to sell rough

⁹⁹ Pers. comm., Spanish, 06/25/02.

¹⁰⁰ Pers. comm., Spanish, 09/23/02.

lumber internationally through a Costa Rican company. As an intermediary, his profit was small. According to Hernandez in 2002, the international price for pine was US\$210 per cubic meter. He could get US\$0.22 per foot for the lumber in Managua. He paid US\$0.11 per foot for transport, plus US\$0.05 per foot to the sindiko. He paid US\$2.47 per cubic meter in taxes to INAFOR and US\$1.75 per cubic meter to the mayor. With the cost of the mill and the machinery, he claimed that he was not earning any profit. “For all the work I am doing, I should earn a good salary, but there is not enough for that.”¹⁰¹

Since Hernandez did not have cash and was getting in debt with the village, sindiko James Rogers agreed to settle the stumpage fee in lumber. He explained:

People come and ask me for wood. I fill out a slip of paper with my signature that they take to the company and are given what they ask for. People can’t sell this wood; it is only for the construction [or repair] of their house. The wood is delivered here by the company.¹⁰²

As there was no system of controls, people began selling the lumber up and down the river, or stockpiling it below their house. Those that did not ask for lumber began to criticize the process. By the time it was stopped by Rogers, Hernandez had already paid 56,875 cordobas to the community by delivering 22,750 board feet of lumber. The village was now in debt to Hernandez.

Many community members continued to be critical of Hernandez, even the sindiko who had originally signed for him to enter. In 2002, Torres stated:

[Hernandez] is a ‘*gato bravo*’ here: he says that only he has rights to cut here. Other companies want to come, but he threatens them. The sindiko has to get on the radio in Managua and...invite other companies to enter. Then we will find one that will pay fairly and fix the road.¹⁰³

¹⁰¹ Pers. comm., Spanish, 09/23/02.

¹⁰² Pers. comm., Spanish, 09/03/02.

¹⁰³ Pers. comm., Spanish, 06/25/02.

Hernandez had other problems. He noted, “INAFOR and others are trying to squeeze me because I am small; they are not trying to squeeze PRADA or MADENSA.”¹⁰⁴ In addition, mayors charged an illegal transportation fee per truck to cross each municipality on route to Managua. The mayor of Prinzapolka collected his taxes, but would continue to ask for money. Hernandez stated, “The mayor calls and asks me for money when he is in Managua. He calls and says that he has no money and he has a bill in a hotel. I have to go and pay what he owes.”

Equipment was expensive and was damaged by the harsh climatic conditions and by the high resin content of the wood. After five years, Hernandez only had half of what he started with. Hernandez had to pay salaries for his mill workers year round in spite of the fact that it was too wet to extract during months of the year. The small management plans Hernandez purchased were insufficient to cover his bills.

In 2003, Hernandez moved into the extraction of andiroba lumber to subsidize the pine. He was selling to an intermediary that sold to the Cuban tourism industry or re-exported to Europe. Hernandez bought a 2003 annual plan from INAFOR and made an agreement with two groups of Alamikangban loggers for 1,700 cubic meters.¹⁰⁵ However, this ended up being conflictive as well. According to the sindiko of Alamikangban in late 2003:

[Juan] has twenty men working. [Jorge] has another twenty men. They are working in a cooperative...Some say that other people worked less. Fifteen days ago the conflict was so much that the Judge decided that the sindiko would administer the money when it comes in. The bosses have kept track of the number of work days for each person. But some already took wood from Hernandez and others got payments...When they do get paid in full, they have to figured out how to distribute it...we said that there should be some benefit to the community.

¹⁰⁴ Pers. comm., Spanish, 09/23/02.

¹⁰⁵ Pers. comm., Spanish, 05/12/03.

Also...each time there are twenty men working, it should be different men so that more people can benefit. Everybody wants work. And we need to get percentage to the community, but we do not know how.¹⁰⁶

According to the sindiko, community members complained that Hernandez did not pay on time and that the price was too low. Hernandez was paying ten dollars per cubic meter and selling it to PRADA's mill thirty kilometers away for forty-eight to fifty-eight dollars, depending on the lumber class.

Hernandez's relationship with INAFOR has been poor. Hernandez admitted that many times he has been late with his reports for INAFOR, but he blamed difficult transportation during field visits to collect the necessary data. He believed that INAFOR representatives are not helpful to smaller companies.

When I ask for information that should be public, or that they should have, they say that they don't have it or can't get it. PRADA and other big companies are well-treated, but small companies are not given the assistance that they need.¹⁰⁷

The above cases demonstrate vast differences of opinion on logging. Sierra and Stallings (1998) show potential diversity within the logging sector with their discussion of the complex structure of lumber marketing linkages in Ecuador. The following logging sector perspectives, documenting intermediary and company owner opinions, demonstrate the challenge to balance potentially conflictive points of view.

People like to blame us intermediaries and say that we make all the profit. We don't determine the prices, the person that we sell to does. If we are still here, it is because we haven't made money. If we had made it, we wouldn't be here. The largest volume [of lumber] is being extracted by people with money, and they are well connected to the government. But, in the end, the *gringos* (North Americans) control the lumber market because they buy the wood.¹⁰⁸

¹⁰⁶ Pers. comm., Spanish, 05/12/03.

¹⁰⁷ Pers. comm., Spanish, 09/23/02.

¹⁰⁸ Pers. comm., Spanish, 10/08/02.

Selling lumber between village loggers and company owners, many intermediaries appear cynical about the intentions of both. About company owners, one intermediary states, “Logging companies think that if they put a sawmill here, people will burn it. That is why they send us intermediaries to look for raw materials and bring logs to the mill. They are washing their hands of their impact on the process by sending us.”¹⁰⁹

Intermediaries wash their hands of the responsibility for deforestation. “I am not the one cutting the forest so that I am not responsible for the destruction. I just buy the lumber that is already cut.” Another concludes, “Even us intermediaries are looking for legal solutions. We don’t like to be delinquents and feel like we are breaking the law.”¹¹⁰ One middleman merchant believes, “Villagers should pay when they cut illegally. They are breaking the law – not the intermediaries. We are paying to legalize the wood.” His associate adds, “Here the people will kill INAFOR and state representatives if they try to repossess illegal wood. So, what they do is negotiate with intermediaries. The wood is owned by the state for being illegal. It is as if we are buying from the state.”¹¹¹ He continues, “INAFOR prefers this because they are going to earn six cordobas per foot instead of the one cordoba per foot that they earn if lumber is extracted with a management plan. This is why they do not give permission for many plans.” These intermediaries suggest that INAFOR creates obstacles so that people cannot obtain legal permits because illegal logging fines are more profitable.

Logging company owners working in the RAAN believe that they are struggling to survive in a difficult environment, and for that reason they are forced into illegality.

¹⁰⁹ Pers. comm., Spanish, 10/09/02.

¹¹⁰ Pers. comm., Spanish, 10/08/02.

¹¹¹ Pers. comm., Spanish, 10/09/02.

An owner stated “The forest sector in Nicaragua is dead, but from this dead, we are still taking blood. What is a forestry sector without industry?”¹¹² One owner admits, “In order to half survive, we need to go illegal.”¹¹³ Another charges, “The government encourages or promotes illegality.”¹¹⁴ One reason for this is that the approval process is long and inflexible. The dry season, during which companies can transport lumber, lasts only three to four months per year. Companies invest with the assumption that they will get the necessary permits for the same season.

Company owners note that they are often placed in a difficult position in indigenous villages because there is no stability in the election of *sindikos* and some new *sindikos* do not respect the agreements made by the previous leader. They believe that they need to fight for their dignity as business owners and remind people that they are a major source of jobs and taxes in a region where both are scarce. Company owners complain that they are slandered in the press, by NGOs, and by municipal and communal representatives. Without his company, one owner believes, there would be more social delinquency, such as theft and prostitution.¹¹⁵ An owner working in Alamikangban complained about local populations, “Even if you come to try to help, they think that you are exploiting them. It is hard to talk to them because they only think so far. They are caught up in one reality.”¹¹⁶

¹¹² Pers. comm., Spanish, 11/12/02.

¹¹³ Pers. comm., Spanish, 11/12/02.

¹¹⁴ Pers. comm., Spanish, 11/13/02.

¹¹⁵ Pers. comm., Spanish, 11/13/02.

¹¹⁶ Pers. comm., Spanish, 07/07/01.

Company owners are being squeezed by shifts in lumber permitting. Mahogany and Spanish cedar are the most profitable species, but INAFOR is reducing extraction of this lumber. A commercial lumber extractor notes:

There is not a strong market for ‘white’ wood, and if we all extract white wood, we are going to saturate the market...[and] there are many white woods that are too dense to float on the river and will need to be taken out by road. This will create the need for major investment in infrastructure. Meanwhile, we will sell white wood for a lower price.¹¹⁷

Although summarizing complex industry sector opinions into a few brief paragraphs, these narratives demonstrate conflict between intermediaries, company owners, indigenous villages, and the Nicaraguan state. There were struggles for control at multiple scales and in various sectors. Meanwhile, insecure land tenure may have caused the greatest conflict. There are many land conflicts in Prinzapolka. The largest contested area is simultaneously claimed by indigenous people and a group of U.S. businessmen who invested in the region in the 1970s.

In 1999, U.S. ranch owners offered Prinzapolka forest lands purchased in the 1970s for sale on the Internet: 58,500 hectares were available at four hundred dollars per hectare. The ad claimed, “This is the largest tract of privately held land between the Darien area of Panama and the northern border of Mexico...The land is ideal for pine plantations, seed harvesting, a wood chip processing plant, and resin harvest...”¹¹⁸

¹¹⁷ Pers. comm., Spanish, 10/17/02

¹¹⁸ The ad continued,

The land has a sparse natural growth of Caribbean pine; the standing pine has good, straight form, with average stand density between 50 and 100 trees per hectare. The majority of the trees are around thirty years of age with a diameter of 35 cm and height of 21 m. There are some pines of about 60 years of age with diameters greater than 40 cm and heights of 24 m. The area was clear-cut in the late 50’s. Much of the timber is of good size for chip-n-saw and many of the trees are straight enough for poles...With a planting of a thousand trees per hectare, the trees will be ready for pulp wood in 12 to 15 years (English; this internet site is no longer available).

During 1908, the Caribbean Shipping and Development Corporation obtained title to this tract of land from the Nicaraguan government. In 1974, four North Americans purchased this land and developed a large ranch with houses, fences, roads, bridges, and a private airstrip. The owners were forced to flee during the Sandinista Revolution. In the 1990s, one of the owners, Robert Merrick, began looking for a means to recuperate the initial investment in the ranch.¹¹⁹

Unaware of Merrick's land title, the *sindikos* of two neighboring Prinzapolka River villages with large territories, Alamikangban and Tasbapauni, registered communal land in the name of the community. Alamikangban's *sindiko* recalled that in 1997:

Tyrson Moreno, from Managua, helped me get the supplementary title. Tyrson and two legal advisors had a meeting here and said that they wanted to give people jobs and to bring cattle ranching. First, they said that they wanted to buy land: 15,000 hectares from Tasbapauni and the same from Alamikangban for a total of 30,000. I said that I could not rent or sell land. The other *sindiko* from Tasbapauni...accepted to either rent or sell...I said that [Moreno] was a *mestizo* and not from here. Historically, colonists came and got leaders drunk. Then they would sell the land for a leaf of tobacco. This was the same thing. They took the *sindiko* from Tasbapauni to the airstrip and got him drunk on liquor and beer. The *sindiko* came to me and demanded that I sign. I finally agreed. We were taken to [Bilwi] where we spent two days with two lawyers signing papers. After that we went to Bluefields and made the *titulo supletorio*. This annulled [Merrick's] title, but I did not know that at this time. When we made the agreement with Tyrson, we talked about five years. I was going to see how it was going before signing for another five years, but when they wrote up the papers, they changed the number [to ninety-nine years].¹²⁰

Robert Merrick's representatives convinced the next Alamikangban and Tasbapauni *sindikos* to sign an agreement renewing his historical claim. They did in 2000. Although there were widespread rumors that the *sindikos* were paid off to assist Merrick in his claim, Alamikangban's *sindiko* at this time claimed that he did it to

¹¹⁹ Internet comm., English, 04/28/03.

¹²⁰ Pers. comm., Spanish, 09/19/02. Illiterate, the *sindiko* did know of the change until after he had signed.

encourage local employment and refute the new ninety-nine year claim by the aggressive, pistol-carrying Tyrson Moreno.¹²¹

People in Alamikangban were initially excited about Merrick's project. One of the North Americans working with Merrick had worked on the ranch in the 1970s and came to talk to people about the project. One elder remembered, "Everyone knows the *gringo* (North American) from before. He did many favors. If we were sick, he would bring us to Managua in his plane. He said that he was not coming to exploit and that he would reforest."¹²² Another village leader added:

He wants to build a tourism center – that's what he said to the people – he said that the people from the U.S. want to come to see trees, animals, and birds. He said that he was not going to throw anyone off the land. He said that he needed one thousand people to work – women and men – to plant trees. People were happy.¹²³

The renewed title signed by the two sindikos in 2000 revived the foreigners' claim and placed communal tenure in doubt. The sindiko who signed the title for Merrick feels like he was manipulated and later treated poorly.

At first he was good. He brought me to Managua. But then he abused me. He wanted me to sign, but I had a problem: I did not have a lawyer. The judge from León pressured me saying that [Merrick] was leaving and it had to be done then...For the offer of work, I signed.¹²⁴

In telling the story, the sindiko recalls pressure from a community leader who was paid a monthly salary by Merrick to promote the project. He was also swayed by promises.

The gringo promised to have another meeting with the community to come to an agreement...He made a lot of promises that he hasn't kept...people were so mad

¹²¹ Pers. comm., Spanish, 06/25/02.

¹²² Pers. comm., Spanish and Miskitu mixed, 06/25/03.

¹²³ Pers. comm., Spanish and Miskitu mixed, 06/25/03.

¹²⁴ Pers. comm., Spanish, 06/25/03.

at me that they killed my animals. Later I spoke to the gringo and asked him to pay for the ten that were killed...He said, 'I don't have to pay for you.' He abused me...If he tries to come here and cut trees – I have a pistol and an AKA. If I have to use them, I will. People said that I earned \$70,000...But it is not true...I want to take out a *comunicado* and tell people about the robbery that he did. But the people from the lower river are *brutos*...If the gringo enters they say they are going to kill me.

Merrick later claimed that he had no intention to sell the land over the Internet as it had been advertised by another project representative. However, learning about the proposed land sale infuriated many local people. The community has been divided over the case since. As Alamikangban's sindiko in 2002 stated:

We aren't against work, but we are against [Merrick] because he wants to trick people. He wants to take possession of our land and impose his law. Now he says that what he has from the government is sufficient and that he doesn't need to talk to the community and have an agreement. We don't know exactly the work that he wants to do here – we do not know his heart.¹²⁵

Since Merrick's ranch coincides with the communal areas of twelve villages along the middle and upper Prinzapolka River, there have been court battles since 1998. Merrick asserts that his private title surpasses indigenous customary use and possession. RAAN courts decided in favor of the foreign landowners in 2000. Local populations were appealing this decision in a regional court at the time of fieldwork. Although some local elites continued to support Merrick, many Miskitu were concerned about this threat to indigenous communal land tenure. These concerns have been documented in national press (López 1999; Jarquín 2000; Centeno 2001).

Merrick created a corporation called EcoForestal, as shown on Map 2, with the proposal of initiating plantation forestry and earning carbon sequestration credits. The project would begin as a private, for-profit corporation with a non-profit counterpart to

¹²⁵ Pers. comm., Spanish, 09/03/02.

fund community services. In the year 2053, ninety percent of retained profit will be passed to shareholders and the project will become a charitable trust. Limited information had been released about the specifics of this arrangement. At the time of fieldwork, delays emerged from the need for economic sponsorship. With a private loan of eight million dollars and a donation of one million, representatives were looking for an additional twenty million.

Since 2000, local populations have been uncertain about the progress of the project. According to an Alamikangban elder, “Merrick is not going to enter *tranquilo* (calmly) to work here.”¹²⁶ Yet, he felt, “Everyone is on the side of [Merrick]. Without money, who is going to be on our side?” However, since the time that this case entered the courts, Nicaragua passed a demarcation law for indigenous lands. Until titling occurs, there is no way to determine the final tenure outcome. Those in support of Merrick are confident that his claim is legal, while those that support the communal claim insist that he will be forced to leave. This is just one example where multiple claims to the same land exist. Areas of Prinzapolka are simultaneously claimed by foreigners, corporations, non-indigenous migrants, indigenous villages, ex-combatant groups, and the state.

In the midst of the land tenure conflict with Merrick, INAFOR was using a voided title for Alamikangban to meet tenure documentation requirements to allow for timber extraction from 2000 to the end of fieldwork in 2003. They used the communal title that was granted to the village in 1997 and that was later voided in 2000 due to the Merrick court case. When questioned, INAFOR officials claimed to be completely unaware that the title had been legally revoked. This demonstrates the limitations of the property

¹²⁶ Pers. comm., Spanish, 07/07/01.

registration system, as well as the lack of communication between interrelated state sectors and scales within Nicaragua. The case had been settled within Autonomous Region courts and decisions were not communicated upward in scale.

CHAPTER SUMMARY

Between 1905 and 1995, there were twenty-two national laws and decrees referring to the protection and use of forests. With more than five hundred articles published in these laws, the nation still lacked a clear plan for forest management as the laws were incoherent, incomplete, and even contradictory (Alves-Milho1996). Most forest policy has failed to accomplish its goals in Nicaragua because it is not upheld. Many decrees simply focused on fines and fees. This regulatory approach was not effective and other destabilizing factors continued to threaten sustainability in the forest sector. There was on-going political conflict and lack of land tenure security. Since 2003, there has been some improvement in state policies and programs; however, the lack of progress in forestry legislation over a decade suggested that the state would be slow to change. Moreover, land tenure and logging conflict in areas such as Prinzapolka demonstrate the challenges faced in transforming Nicaragua's forest sector.

Indigenous decision making power in every case in this chapter was limited. The structural context for forest extraction clearly reduces the options for Nicaraguan actors, whether business owners, intermediaries, or indigenous populations. Nevertheless, this chapter has highlighted the actions of individuals and ways that they expressed agency through the choices that they made. These actions and choices had specific implications for big-leaf mahogany, as activities at multiple scales and in various sectors coincided to encourage unsustainable extraction.

CHAPTER FIVE

Re-scaling Forest Governance at Sub-national Scales

Nicaraguan forest governance is undergoing a period of rapid transition. This chapter examines the interplay between simultaneous scale reformulations at the sub-national level documented during fieldwork. My research findings in this and subsequent chapters demonstrate that decentralization has not been easy to implement in eastern Nicaragua. Different versions of decentralization have been mandated from above and leveraged from below. Initially, actors at higher and lower scales envisioned very different governance structures and goals. While important advances have been made, key challenges continue.

Processes are closely linked to scalar rivalries outlined in Chapter One under the discussion of decentralization. The “politics of scale” framework (e.g., Smith 1992; Swyngedouw 1997a, 1997b) helps identify how actors at different scales compete for power and attempt to bend scale to their benefit and disadvantage less powerful groups. While linkages to transnational actors are seen to be an important factor in the ability of groups to jump or bend scale, this chapter also focuses on internal processes to demonstrate agency among Nicaraguan at multiple levels and various sectors.

Centralism in Latin America historically served a small elite group (Baltodano 2002). In Nicaragua it has been tied to an authoritarian system of governance with political *caudillos* (patrons). In the 1980s and 1990s, arguments justifying decentralization were broken down into two main camps. Decentralization was promoted to: improve financial efficiency and increased administrative speed and flexibility; or increase democratic participation, including a framework for maintaining and

strengthening regional or local ethnic identities. While the first type of decentralization was pressured from above by international donors, the second type was leveraged from below by local groups.

Decentralization in Nicaragua has been a conflictive process. While advocating municipalization, international donors were in large part opposed to regionalization under autonomy. Their primary goal for decentralization was financial efficiency. President Chamorro followed this lead. Ortega Hegg (1998: 9) noted:

The politics of decentralization have been pushed by multilateral lending institutions, such as the IDB, World Bank, USAID, and other agencies. Clearly, in the case of Nicaragua, it is possible to affirm that decentralization appeared to be more of a preoccupation of these organisms than of the Chamorro government.

Since 1990, international donors have pressured for state decentralization in Nicaragua. The World Bank funded *Protierra*, which was focused on institutional development in municipal governments and community and local private sector training. Decentralization was linked to structural adjustment programs. Downsizing the central government was a condition for future economic assistance. Many state programs, in areas such as environment, education, and health care, were reduced (Walker 2003). Sub-national institutions were pressured to take over responsibilities abandoned by the central government (Baltodano 2002).

During the 1990s, there was tension between the two decentralization paradigms with their distinct frameworks, goals, and target populations. Yet, recently, Larson and Ribot (2004) report that the reasons aid agencies pressure for decentralization have begun to change. Early reforms emphasized national cohesion, effective rule, and efficient management, while more recent programs have begun to address democracy, pluralism, and rights. Today, with paradigm shift to participatory practices, the same donors that

promote market liberalization and the privatization of resources for commercial exploitation also promote community-based management.

In the 1990s, different international donors supported various types of decentralization in eastern Nicaragua without being totally aware of the conflict that ensued. For many years, the legal framework for Nicaraguan decentralization was ambiguous, overlapping, contradictory, and diffuse. In practice, decentralization was similarly problematic. Municipal governments did not respect the decisions of communal leaders, as they fought to be respected by the autonomous government. The central government kept a tight rein on the autonomous government and supported decentralization to less threatening municipal entities. The regional government and communal leaders struggled to create and implement new natural resource responsibilities.

According to Ortega Hegg (2002), municipal and communal decision making structures are in contradiction because the municipality is based on individual needs, whereas the villages have a cooperative structure. Municipalities have been superimposed on indigenous villages. Acosta (1996) believes that the increase in power in the municipalities meant a decrease in power in indigenous communities. When municipalities were created, communal land holdings were reduced. Yet, in 2002, an indigenous leader stated, “Municipal governments do not include us. Communal and municipal are two very different concepts and they are in conflict much of the time.”¹²⁷

In Nicaragua, the shrinking of the national government, as a result of structural adjustment programs, was a justification for decentralization. According to Baltodano

¹²⁷ Pers. comm., Sumu-Mayangna with Spanish translation, 11/13/02.

(2002), “In this new reality, the municipality acquires singular importance as the institution that supplies...diverse functions abandoned by the State.” This attitude, popular in much of the country, may be appropriate outside of the Autonomous Region, but it creates conflicts within the RAAN.

DEVOLUTION TO REGIONAL INSTITUTIONS

Within the formation of autonomy under the Sandinista administration in the mid-1980s, debate surrounded the distribution of earnings from natural resource exploitation. The draft autonomy law stated that the Caribbean coast population would benefit in “just proportions,” but many people wanted a more specific amount to be legally established (Butler 1997). Due to the war and the economic crisis at the time, it was agreed that it would be better to negotiate proportions on a yearly basis. After regional groups accepted the proposal, and it moved to the National Assembly for approval in 1987, terms were not renegotiated. In fact, the regulations of the Autonomy Statute were not approved for another sixteen years.

The incoming president in 1990, Violeta Chamorro, tabled bills under discussion in the National Assembly that would have clarified autonomous governance. She openly defied the Autonomy Statute when she created an Institute for Development of the Autonomous Regions (INDERA) without consulting either of the regional governments (Butler 1997). This national agency had a budget greater than the north and south regional governments’ budgets combined. The primary joint project of the two new regional governments was to push for removal of INDERA. In 1994, after four years, they finally won and INDERA was eliminated.

In 1996, Acosta (1996: 8; translated by author) concluded:

In spite of the fact that the process of autonomy was initiated nearly a decade ago, the communities and indigenous people that live in the region are far from forming an active part of the autonomous process, which in many cases has not signified any effective change...although autonomy was originally set forth by the indigenous as an autonomy for them, within a national unity...it has turned into the creation of another bureaucratic state structure on top of the traditional communal structures. Today the communities continue to develop themselves at the margin of the regional autonomy process.

In 1999, the rector of the Autonomous Region's URACCAN University stated:

The process that formed the National States of our countries was dominated by a logic that still affects us today: excessive centralization of government, absence of coherent public policies regarding decentralization that take culture and ethnic traits into consideration, and the imposition of a development paradigm that has favored monoculture, verticalism, eurocentrism, and ethnocentrism (As quoted in Alemán Cunningham 2002: 7).

A governor and regional council, whose president oversees forty-five councilors, lead the RAAN regional government.¹²⁸ The regional council has six active commissions, including natural resources and production, municipal and communal affairs, and external cooperation and internal relations (Proarca/Costas 1997). In the mid-1990s, the president of the RAAN council stated, "The disputes among coastal leaders totally undermine the capacity of our autonomous governments to take any initiative with the central government" (González 1997a: 32). Many times the disputes fell along political party lines, with national parties playing an important role.

In initial years, the new regional governance structures did not make the most of the opportunities entailed in autonomy. All three of the first regional government administrations had serious administrative problems. There was a lack of control over natural resource extraction. According to an INAFOR delegate in Bilwi in 2001:

¹²⁸ Three councilors are from Prinzapolka.

If one party backs a company or [forest management] plan, the other party will go against it just for politics. Often one person, usually just the president, signs off and sponsors a plan or a permit instead of the whole regional council because it is impossible to get approval from a majority. If one bench submits a topic for the agenda, another works to get it cut.¹²⁹

The regional government was dependent on the central government for funding. As insufficient funds were granted from the central government, regional bodies created new fees. When regional charges on forestry permits were new, they spurred complaints. A forestry official stated, “The reason that most logging companies do not have permission from the [regional government’s] environmental commission is that they are trying to charge ten to fifteen thousand cordobas per permit. This is unjust. It is too high.”¹³⁰

Slowly, in recent years, the regional government has improved natural resource management. In 2001, a Natural Resource Secretary (SERENA) was created. SERENA was responsible for the technical processes of overseeing concessions and completing environmental impact assessments for natural resource projects. After a change of administration in 2002, the regional government began to network more with state ministries at various levels. By 2003, it had begun to play a proactive role in development programs and projects. During 2002 and 2003, the majority of regional councilors were enrolled in regional university programs focusing on natural and social sciences. Higher education opportunities in the RAAN were not available until the mid-1990s, and many professional adults have chosen to return to school now that they are.

¹²⁹ Pers. comm., Spanish, 07/12/01.

¹³⁰ Pers. comm., Spanish, 07/12/01.

Although funding was still a problem, international donors increasingly assisted regional programs and development planning. The United Nations Development Program (UNDP) and several multilateral banks funded project offices in the region. Previously, each donor was uninformed about what others were doing, but in 2003 the regional representatives of large donor agencies worked in conjunction to write a strategic regional development plan. Project offices were established in the same building and donor coordination improved. This facilitated the sharing of infrastructure; for example, Internet was too expensive for each project to individually install in the remote region.

The regional government's Natural Resource Secretary received technical and economic assistance from several international institutions, such as the World Bank and WWF. With WWF support, in 2003, the regional government consulted with local populations and created a regional strategy for forestry development with a strong indigenous component. This was one area where the articulation of several scales and sectors was evident. The Consultative Forest Committee met with groups in each of the municipalities, organized workshops in Bilwi and Managua, studied reports from donors like the World Bank, integrated strategies from national development, forestry, and anti-poverty plans, and interviewed a broad range of state and NGO representatives.

In spite of recent gains, there are still mismatched scales of governance. For example, *most international agencies filter funds through central governments, even when targeting the Autonomous Region*. The result has been delayed RAAN projects' execution because of insufficient resources. The vast majority of spending is utilized in the capital city. This type of scale disjuncture is sometimes corrected in middle or later

stages of a project or program funding cycle, but the time and funds remaining may not be sufficient to meet goals once devolution has occurred.

Another scalar mismatch results from the lack of articulation between regional and municipal institutions. According to a decentralization expert, the regional government's role is still sometimes unclear to officials.

There are things that can't be done by the individual municipalities and this is the work of the regional government...The regional government should not be doing things that can be done by municipalities. They should lead decentralization.¹³¹

DEVOLUTION TO MUNICIPAL INSTITUTIONS

A good indicator of decentralization is the amount of fiscal transfers given from the central government budget to local governments. A national decentralization expert at the University of Central America states, "If you are going to talk about decentralization, you need to see where the resources are – the rest is just discourse."¹³² In Europe, fiscal decentralization to local governments comparable to Nicaragua's municipalities often reaches seventy-five percent. Transfers to local governments in many developed countries approach fifty percent of the total national budget. In Latin America, the most fiscally decentralized country is Brazil, with transfers to local governments of over twenty-five percent national budget. In Central America, most states transfer more than Nicaragua, which has been known to grant less than one percent. In recent years, Guatemala has given ten percent to municipalities, El Salvador six percent, and Honduras and Costa Rica five percent.

¹³¹ Pers. comm., Spanish, 12/06/02.

¹³² Pers. comm., Spanish, 12/16/02.

There was deterioration in the amount given to from the central government to Nicaraguan municipalities from the 1980s until 2003. The Sandinistas gave up to nine percent at one point during their administration. This percentage came down during the Chamorro government and was lowered even more by the Alemán administration. In 1997, twenty-seven municipalities either declared bankruptcy or announced that their budget was not financially viable. Meanwhile, with municipal policy reforms, local responsibilities greatly increased. Municipal governments became responsible for social service provision, natural disaster relief, and environmental management. In terms of decentralization, “Finance should follow function” (World Bank 2000: 117). However, in Nicaragua, as a result of changing tax laws, municipal funding decreased. In 2002, a decentralization expert noted the inadequacy of municipal transfers from the central government.

Two to three years ago, it was 0.33 percent of the national budget. Two years ago, it was 0.98 percent. Last year, 1.2 percent was approved, and 0.57 percent was actually given... This year, because [the National Assembly deputies] wanted to take money away from [President] Bolaños, the municipalities won. In 2003, they will get four percent, but only for political reasons.¹³³

Ortega Hegg (2002) adds that the rapid increase of money for municipal governments did not contribute to fiscal responsibility. It caused international donors, such as USAID, to scramble to train local officials in accountability since they were unaccustomed to managing this quantity of funds. Municipal transfer is scheduled to increase to ten percent of the national budget by 2010. Managed properly, these funds could advance decentralization. However, some Managua politicians have discussed the

¹³³ Pers. comm., Spanish, 12/16/02.

capabilities of decentralized institutions to administer money.¹³⁴ They fear losing equilibrium in the management of state resources if each decentralized entity does what is best for them, instead of looking at the national picture.

The fear of central government officials that municipal government leaders will primarily serve local interests is largely justified. The attitudes of municipal governments in the RAAN in 2002 and 2003 could be broken into two camps. The actions of both groups were likely to be criticized at higher scales. Prinzapolka municipal leaders, as discussed below, were strongly allied with illegal lumber extractors, which allowed state resources to escape capture or to be misappropriated. Another group of municipal leaders was strongly against illegal logging, even if it meant a moratorium on all extraction. In November of 2002, the mayors of three municipalities attempted to jump scale when they solicited a moratorium on the extraction of precious woods at a regional level from the RAAN government (author's fieldnotes).

In 2003, one municipal government was detaining logging trucks and demanding documentation and even visiting rural areas where illegal lumber was believed to be felled. Although INAFOR argued that the above type of municipal intervention was an example of local governments usurping power, local officials argued that they must protect the natural patrimony of their municipality. In a letter denouncing state corruption, one mayor criticized that INAFOR delegates acted like “a fox left to care for hens” (quoted in Imhof 2003b: Internet; translated by author).

¹³⁴ Pers. comm., Spanish, 12/06/02.

Prinzapolka's Municipal Government

Prinzapolka is an old municipality. The spatial scale of the municipality has shifted many times in the last century and boundaries are fluid. Analysis of historical data is challenging because different areas were included across time. Before the incorporation of the Miskitu Reserve into the Nicaraguan state in 1894, the central government created three districts, including Prinzapolka, and two *comarcas* (regions) surrounding the reserve to extend state institutions into the region (Gordon et al. 2003). After Nicaragua's east joined the west, the Prinzapolka municipality was created. It included what are now four municipalities. These split off one by one between 1969 and 1989. In 1989, Prinzapolka's seat moved to Prinzapolka Bar. In 1997, the seat was transferred to Alamikangban, a more central location, to improve access, communication, and commerce.

Nicaraguan higher government levels have left municipal political boundaries unclear (González 1997b). Municipal elections in the autonomous regions should have occurred for the first time in 1994, but the timeline was extended to 1996 because the Autonomy Statute stipulated that the regional councils had to define municipal boundaries first, and this had not yet occurred (González 1997a). In 1996, the central Nicaraguan Institute of Territorial Studies published the official boundaries (INETER 1996). Yet, in the late 1990s, there were a total of seventy-eight boundary conflicts between the 147 Nicaraguan municipalities that existed at that time.

Prinzapolka has experienced recent boundary conflicts with four neighboring municipalities (author's fieldnotes). Municipal boundaries are not always clear to state agencies, which contributes to fluidity in their perceptions. The Úbeda Brothers' logging

company was granted a forest concession in Prinzapolka in 2001, but since the location was incorrectly assumed to be in another municipality, the taxes were not paid to Prinzapolka. Meanwhile, officials in another neighboring municipality grant land titles for areas located in western Prinzapolka (Treminio Urbina 2002). The Prinzapolka government does not have the resources to have a presence in the far extremes of the large municipality.

Prinzapolka has arguably the least effective municipal government in the RAAN. Leadership of the municipal government changed three times during my twenty months of fieldwork. From 2002 to 2003, the standing mayor visited the seat of the municipality less than a dozen times.

When I had arrived to live in Alamikangban, a municipal consultant came to the village and announced that he would host a meeting the following day to receive feedback on Prinzapolka's development plan (author's fieldnotes). When participants gathered, they received copies of a document that had been written by this outsider from the capital city. Over eight months, during which he received a salary approximately forty times greater than the salary of a local teacher, he had drafted a twenty-page proposal identifying important municipal needs. During this time, the consultant had little input from RAAN inhabitants.

At the meeting, the consultant informed approximately fifteen invited village participants, who were all from Alamikangban in spite of the fact that there are more than thirty villages in the municipality, that their task would be to choose the order of the pages of the final draft of the development plan that would be handed to the president the following day. The consultant did not want any marks on the proposal.

Community members wanted to give substantial input and erupted with frustration during the three-hour meeting. They were angered that a matter of hours before the plan was to be handed to the president, their opinion was being asked for the first time. They wanted to discuss the limited space for participation in the municipal government, but they were repeatedly hushed by the consultant who insisted that the municipality needed to put forth a united front the following day to erase the image of disorder that was plaguing the local government and impeding its reception of funds from the central government and international donors. He also accused critics of wanting too much from the government and proposed that if they put down their real needs, they would end up angering the president with their demands.

In the end, there was considerable agreement on the order of the pages (which was what the outside consultant allowed local populations to decide): communication and transportation infrastructure were the greatest necessities, education and health care were vastly under-funded, and so on. To terminate the meeting, a teacher, judge, police officer, pastor, and NGO representative were chosen to travel the following day to present the “participatory” proposal to the president and representatives of the Fund for Emergency Social Investment (FISE) at a region-wide meeting. FISE distributes money from the World Bank and the Inter-American Development Bank.

After additional time in the Prinzapolka, more governance problems became apparent. Local populations accused each of the past three mayors, and sometimes their vice mayors, of corruption (Jarquín 2001, 2003a; Centeno 2002, 2004; author’s fieldnotes). Once, when Mayor Hilario Thompson came to Alamikangban in 2001, local

people kidnapped him. He was held overnight, but the elder council and judge intervened when local youth were going to force him to drink swamp water.

Under Mayor Thompson, who took power in 1997, Prinzapolka's fragmented administration meant that logging companies were charged for three fees by numerous municipal representatives. According to his vice-mayor, Thompson collected all municipal taxes from the logging companies directly.¹³⁵ Those who ran the office had no record of these funds. Since these officials did not have a budget for municipal administration, they would contact logging companies to fundraise to maintain the office and implement projects. They also charged four hundred cordobas per logging truck as an exit fee. Road charges are invented by most Nicaraguan municipalities, but do not have legal backing. Municipalities that source lumber, such as Prinzapolka, are able to demand fees because companies need municipal approval for the INAFOR logging permit. Municipalities with primary roads charge transit fees per truck or they do not allow use of their roads.

Prinzapolka mayors seldom live in the municipality once they are elected. The next mayor during my fieldwork, Santiago Obando, who began in 2001, spent considerable time in Managua. His vice-mayor, Hamilton Thompson, the ex-mayor's brother, was removed from power after he did not show up for work during the first sixty days (Brenes Flores 2001). This vacant position was not filled for nearly two years.

The pattern of collecting multiple lumber fees continued under the Obando administration. This mayor and municipal councilors also made special requests from logging companies. Based on a new state policy, twenty-five percent of forest concession

¹³⁵ Pers. comm., Spanish, 10/21/02.

payments paid to INAFOR returned to the municipality. Prinzapolka officials would travel to Managua to receive these funds. One INAFOR official remembers being astounded when he observed the Prinzapolka councilors in 2002 split up the municipality's portion among themselves before leaving INAFOR offices.¹³⁶ Later, according to the municipal administrator, once a bank account was established in the RAAN to directly deposit these tax monies, the mayor withdrew all the funds and closed the account.¹³⁷

Under Obando, a lumber inspector was established on the road, connecting Alamikangban with the rest of the country. The post was strategically located outside of Prinzapolka at a key transportation intersection in a neighboring municipality. Municipal officials believed that the mayor visited this post and withdrew funds before they reached the municipal coffers.¹³⁸ According to the municipal administrator, there was also concern that the post inspector was falsifying numbers.¹³⁹ Inspection was later moved to Alamikangban to avoid paying rent to the neighboring municipality. According to Prinzapolka's municipal wood inspector at the time, logging companies and intermediaries could then move lumber out of the zone without his being aware due to the fact that he was stationary in town and they worked in outlying areas.

The municipality of Prinzapolka receives money from the central government, but at the time of fieldwork, these funds were managed with considerable discretion, according to interviews with the municipal administrator.¹⁴⁰ Often the municipal

¹³⁶ Pers. comm., Spanish, 11/12/02.

¹³⁷ Pers. comm., English, 11/01/02.

¹³⁸ Pers. comm., Spanish, 11/11/02.

¹³⁹ Pers. comm., English, 11/01/02.

¹⁴⁰ Pers. comm., English, 04/29/02.

councilors would pay their own salaries, but leave the salaries of other municipal employees unpaid. Councilors were to be paid a stipend for holding sessions, but according to a municipal official, Prinzapolka councilors would pay themselves even when they had not met.¹⁴¹

Prinzapolka hired a municipal accountant in September of 2001. In 2002, this individual described municipal accounting as “really rank.”¹⁴² He said:

The municipal bookkeeping is a mess. There are not receipts for many things. Everyone has receipts in different places. Not all receipts have been turned over. There is a lot of information missing. Receipts are out of order and everyone has different pieces.¹⁴³

In January of 2003, Prinzapolka’s Mayor Obando stepped down, citing his advanced age and poor health, but his council members accused him of squandering 1,600,000 cordobas (Jarquín 2003a). Similar activities were rumored to have continued under the following mayor, who completed Obando’s term until the end of 2004 (Centeno 2004; author’s fieldnotes).

I have provided considerable detail on administration within the municipal structure because it highlights the poor integration of governance scales in eastern Nicaragua. Municipal actor’s decision making is largely independent of processes occurring at other scales because linkages to other levels were poor. I think that activities in Prinzapolka suggest that the advance of decentralization in terms of the creation of new scales, ironically, requires greater interpenetration among levels. *Only when there is built trust, shared agendas, and mutual gain will actors at higher scales put their neck on*

¹⁴¹ Pers. comm., English, 11/01/02.

¹⁴² Pers. comm., English, 04/29/02.

¹⁴³ Pers. comm., English, 04/23/02.

the line for those at lower levels. If networking between scales does not progress, I think domination of the lower by the higher is probable.

The following section looks at forest management deconcentration to regional and municipal scales. As noted in Chapter One, devolution involved the creation of new sub-national scales (Rondinelli and Nellis 1986; Larson 2002). Deconcentration, in contrast, involves the handing over of responsibility to lower levels of central government. Like devolution, deconcentration is challenged when the central government retains power at the center. In addition to the lack of political will, the disorganization of decentralization processes in Latin America can also serve to maintain centralization (Larson 2002).

DECONCENTRATION IN FOREST MANAGEMENT¹⁴⁴

A national INAFOR official, Mario Rocha, admits, “We need to be closer to the people...In some areas there is control, but in others, there are more problems.”¹⁴⁵ If effective, deconcentration can bring the state closer to the people, leading to the creation of appropriate policies, and may also improve law enforcement. Another argument for the decentralization of natural resource management is that local officials are more aware of local realities and the needs of the populations that they govern. Central government officials are notably insensitive to Miskitu poverty, as well as their customary land rights. According to Rocha, “Communities are selling trees for two hundred cordobas. They are not interested enough in the forest.” Rocha concluded that indigenous populations sell trees for too little due to lack of interest. In contrast, local populations attest that they are forced to accept low prices because the sale of timber is often the only available income

¹⁴⁴ For further discussion of state natural resource institutions in 2002-2003, see Appendix Four.

¹⁴⁵ Pers. comm., Spanish, 12/14/02.

they have to sustain their family during economic hardship and between agricultural harvests. Like many national officials, INAFOR's Planning Director, Simeón Martello, believed that lumber should be burned if it is illegal and processes for legalization should not be encouraged because they create a vicious cycle where people continue to cut illegally. A lumberjack working in Alamikangban criticized this attitude, "The national INAFOR authorities would rather lose the wood that is cut now in order to save what will be cut in the future. They are eating well. They would rather see the wood lost."¹⁴⁶

In recent years, INAFOR has been administered through various districts. In the RAAN, there are two districts. District one, located in the northeast of the region, involves the two municipalities of Puerto Cabezas and Waspam. Prinzapolka, and the three municipalities known as the Mining Triangle (Siuna, Bonanza, and Rosita), make up district two and the remainder of the RAAN. The delegate for district one stated:

Decentralization does not exist in INAFOR – what exists is deconcentration. If it were truly decentralized, it would need to be decentralized in technical decisions, administration, and finance. There has been some deconcentration of operations and technical aspects, but finances are still centralized.¹⁴⁷

He added:

I have passed resolutions, fines, and sanctions based on regional realities, but Managua has annulled them – thrown them out. We need to be able to apply the law based on our regional reality. Why make decisions here if they are not going to be upheld?¹⁴⁸

This official noted that what the central government has done through deconcentration is to say, "Take the work, but give me the money," which Larson (2002) documents has occurred in natural resource management in other parts of Nicaragua.

¹⁴⁶ Pers. comm., Spanish, 07/28/02

¹⁴⁷ Pers. comm., Spanish, 11/19/03.

¹⁴⁸ Pers. comm., Spanish, 11/19/03.

Lumber exportation was previously managed at a central level. Now it is managed in the region, but without the personnel and resources necessary for proper control. District two delegate, José Jimenez, stated:

This region of INAFOR is where the most extraction is occurring. INAFOR is not able to fully control the situation because we have too few staff and resources. We only have one truck, which is used by the delegate. This means that the foresters do not have transportation to do field visits.¹⁴⁹

INAFOR is only one of many state agencies undergoing processes of deconcentration. Most government posts in the RAAN have limited resources to carry out programs (author's fieldnotes). Jimenez continued, "The people who have control over timber transport are the police...they do not get a budget to help us on a formal basis even though the law says that they have to help us. The army wants money from us if they will help."¹⁵⁰

Nicaraguan municipalities are often insufficiently funded (Larson 2002). There is only one INAFOR representative for Prinzapolka, in spite of the large size of the municipality (author's fieldnotes). This state forester does not reside in the municipality and carries out his duties from the district two offices located in a neighboring municipality. He relies on public transportation, which makes his visits inconsistent. He rarely has a presence in smaller villages due to transportation limitations. INAFOR's representative is spread thin by heavy extraction in various diffuse areas of the large, remote municipality. The forester also complains that a backlog of paperwork often keeps him from spending adequate time in field. In 2002, he complained, "I am expected to arrive every ten to fourteen days to follow what is happening. Here, that is

¹⁴⁹ Pers. comm., Spanish, 03/11/02.

¹⁵⁰ Pers. comm., Spanish, 03/11/02.

impossible.”¹⁵¹ Logging companies are not always cooperative with local officials, who are not respected because it is clear that they are unable to enforce the law. The forester explained:

Each sawmill has to record the day the lumber entered, the number of trucks, and list [INAFOR] permit numbers. Each month they supposed to report [this data] to INAFOR, but they do not. When we try to impose the law, they start to cry and we can't apply it rigidly.¹⁵²

According to Prinzapolka's municipal wood inspector, one of his greatest constraints was lack of communication with district one INAFOR, including the municipality's INAFOR forester.

INAFOR just keeps giving more permits and legalizing wood without controlling the amount that is actually taken. INAFOR does not consult with the community. They give permits based on money and not on what is best for the owners of the forest...I am often unclear of the amount of permission that people have because it is not written. People tell me that they still have not extracted the lumber allowed in their permit, but they have used the same [permit] over and over...I can see when they have already taken out the specified amount, but in Rosita they have no idea and don't have any tally on the illegal extraction.¹⁵³

Municipal government officials felt that they had to see if INAFOR permits were followed, since the forest institute had not achieved control. Prinzapolka's lumber inspector stated:

Without someone here measuring, [lumberjacks] would never stop filling trucks on the same permit. If somebody catches them, they say they did not have the money to work and were not extracting until now – meanwhile, they have been harvesting continuously.¹⁵⁴

¹⁵¹ Pers. comm., Spanish, 05/09/02.

¹⁵² Pers. comm., Spanish, 05/09/02.

¹⁵³ Pers. comm., Spanish, 10/09/02.

¹⁵⁴ Pers. comm., Spanish, 10/09/02.

Since logging intermediaries and companies can sell permits from one to another, it was difficult for municipal employees to verify legality. Municipal officials complained that INAFOR did not communicate who are the recipients of legal permits.

According to the municipal accountant in 2002, INAFOR was often delayed in transferring fees owed to the municipality. He said:

INAFOR doesn't like to pay either, but they have lots of money. Now and then they give five or ten thousand cordobas, but they owe a lot more. They say that they will pay the rest that they owe, but they don't pay all of it. They say they are going to check, and going to check, but they never get through checking.¹⁵⁵

The above discussion demonstrates that decentralization in my study area faced substantial challenges. Although there has been some devolution to regional and municipal government officials, power and finance still remains at the center to a large degree. Deconcentration within the INAFOR was a new process and had advanced little during the period of fieldwork, although district and municipal officials had many responsibilities. Decentralized governance is unlikely to succeed when the risks and costs devolved to local groups are too great (Ribot 2004; author's fieldnotes). Clearly, similar problems occur internationally (Morris 1992; Rondinelli and Nellis 1996; Larson and Ribot 2004).

In the midst of contested scale shifts during state decentralization, the Miskitu are struggling for self-governance at the village level and other intermediary levels. The following section examines recent Miskitu governance regimes in Prinzapolka.

MISKITU GOVERNANCE: AN EVOLVING MULTI-SCALE STRUCTURE

After consultation with many leaders, a summary of recent communal governance was compiled by Proarca/Costas (1997), with funding from USAID. With funding from

the World Bank, the Central America and Caribbean Research Council (CACRC) documented communal leadership in more than one hundred villages (see Hale et al. 1998; Gordon et al. 2003). Besides these detailed works, regional studies make general points about current Miskitu governance (e.g., Rivera et al. 1996; González Pérez 1997; Roldán Ortega 2000; Alemán Cunningham and Barbeyto 2001; Alemán Cunningham 2002).

Elders are granted authority in the Miskitu culture and there are elder councils in most villages. At the end of the civil war, a regional elder council emerged to assist Miskitu refugees in Honduras. According to the founding president, the regional council began in 1986 with trainings for the refugees and combatants in Honduras.¹⁵⁶

I entered officially as head of the elder council in 1989. There were thirty-six men from Bluefields, the Northern Flats, Coco River, and all over at the meeting. Five men won positions. This set the footing for an organization that is now international.

Later, the elders' scope broadened and the council took on a more general governance role. They have hosted nine general assemblies, which have received support from international institutions, such as European NGOs, embassies, and national sources. More than 1,200 representatives from 225 communities attended the assembly in 1998. Participants generated a statement reading:

We are aware of the many problems and dramatic social and economic situation that we face...these problems cannot be overcome until we resolve the legal status of our territory...[We] must necessarily take control of our natural resources in order to preserve them and use them for our own necessities. In this way, we continue to preserve our culture and our existence [translated from Spanish by author].

¹⁵⁵ Pers. comm., English, 04/29/02.

¹⁵⁶ Pers. comm., Spanish, 07/09/01.

The elder council has advanced a large land claim covering the area historically dominated by the Miskitu, which includes much of the Autonomous Region. The council is the strongest in the municipalities of Waspam and Puerto Cabezas, but representatives from across Nicaragua's north and southeast and from Honduras' Mosquitia attend assemblies.

According to an elder, "Nicaragua is one thing and the Moskitia is another. We need to go to the international level if Nicaragua claims the Moskitia as its own."¹⁵⁷ The elders frequently discuss their foreign relations strategy with neighboring countries, such as Colombia, Honduras, and Costa Rica, and intend to take their case to international human rights courts. Although there is a general plan to assert their claim as a Miskitu Communitarian Nation, there are not well-articulated, specific goals of how to influence international courts or national decision making bodies. The Miskitu would need to forward a compelling argument to gain support to succeed from Nicaragua and create this nation, as the elders propose. Meanwhile, the council's gains are seriously restricted by their lack of economic and human resources. According to a Nicaraguan expert on decentralization, Miskitu ethnocentrism also creates conflict with other regional groups.

The big challenge of autonomy is living together and respecting one another. The different ethnic groups need to negotiate within the region, if not, then there will be imposition from the central government...The Miskitu need to work with others...Their political vision is exclusionary and this creates a weakness because they lose the support of others.¹⁵⁸

However, the council's legal representative stated in 2002, "We promote indigenous and multiethnic development. The elder council does not want to discriminate

¹⁵⁷ Pers. comm., Spanish, 01/22/02.

¹⁵⁸ Pers. comm., Spanish, 12/16/02.

against any of the other ethnic groups in spite of the fact that the original land claim was made by the Miskitu.”¹⁵⁹

In spite of their different strategies, the Miskitu political party YATAMA, the elder council, and other Miskitu organizations cause the government to come to terms with indigenous positions (Ortega Hegg 2002; author’s fieldnotes). They challenge the central government to understand coastal reality and force state officials to recognize opposition. The elders wish Miskitu self-governance at a regional scale, but they generally reject working through YATAMA because they view political parties as a non-indigenous form of organization. In 2002, an elder stated:

The traditional institutions of the Miskitu are the family and the community. At a larger scale, we work with assemblies and conventions. Political parties are not part of our history; they are based on deception. Elections as they are now are a problem. Politicians lie and take our resources.¹⁶⁰

Swarah is a militaristic counterpart of the elder council that began in 1994. According to the organization’s president, at the founding assembly, they created a flag, as described below.

First [the flag] only had a crown, but we decided to add an arrow to show that we have struggled and fought. Then we added a canoe. We used to travel from the Coco River to Corn Island and beyond to Jamaica to defend our territory. The canoe is also an instrument of war. This was why we added the paddle as well, to show that it is an instrument of struggle and travel. From the time of Somoza to the time of Sandinistas, we have had our heroes. Their souls are shown by the dove, which is the messenger. This is also symbolism of the baptism of Jesus. We put a scroll, which defines how and what to do, in the dove’s mouth.¹⁶¹

¹⁵⁹ Pers. comm., Spanish, 01/22/02.

¹⁶⁰ Pers. comm., Miskitu with Spanish translation, 02/22/02.

¹⁶¹ Pers. comm., Spanish, 07/20/02.

According to the president of the elder council, the first flag of the Moskitia was created in 1632.¹⁶² A Swarah leader tells how their flag was hung in 1998 in Bilwi's central park for the first time in over a century.

To put the flag up, we chose the twelve bravest fighters from the communities, including two women. We chose to put up the flag during [President] Alemán's campaign. We did it at 8:00 p.m....in front of the statue of the Indian [hero] *Miskut Viejo*. There was a party in the whole city that night because of the end of campaign. We stood in the park with a bottle of *Ron Plata* filled with water so we would not be noticed, but we all carried our arms and were prepared to kill or be killed... We put up the flag and decided to kill whoever touched it.¹⁶³

The army took the flag down the next morning. The leader explained:

At two in the morning a patrol went past and noticed. They came back at three. They stayed a half of an hour and left. The Holy Spirit was protecting the flag and they were afraid to take it down. Then, at five, we started to take shifts to go home, eat, bathe, and come back. Journalists and others came to talk to us and I was in the last group to go. When I came back at nine, the flag had already been taken down. Many from the army came, but they were not able to get the flag from us.

Later, the state's Supreme Electoral Council decided that it was the Miskitu's historical right to hang the flag. The warriors went back, this time legally, and put the flag back up, while singing the hymn "*God Luhpia*."

President Alemán later ordered the military to again take down the flag and hung a placard in its place. Signed with his name on the bottom, it stated, "I will not rest until Nicaragua's Atlantic Coast is integrated socially, politically and culturally" (Zimmerman 1998: 5). This is nearly the same statement proclaimed by President Somoza in 1975, who vowed, "I won't rest until I see the Atlantic Coast integrally incorporated into the economic, social, and cultural life of my country" (as quoted in Hale et al. 1998: 28).

¹⁶² Pers. comm., Spanish, 03/12/02. See Offen (2003) for the importance of the flag as a cultural symbol.

¹⁶³ Pers. comm., Spanish, 07/20/02.

The Miskitu desire for self-rule at a regional scale continues. Since the 1990s there have been interesting attempts to scale up local village leadership to regional structures. The regional Miskitu elder council, Swarah, and their united goal for a Miskitu Communitarian Nation demonstrate desire to self-govern the area historically claimed by the Miskitu. In 2003, the elder council drafted a constitution for the governance of the region based on collective rights and a return to communal organization.

While village institutions form the base of Miskitu self-governance, a customary form of “scaled up” governance is the multi-village bloc. Multi-community blocs emerge when two or more villages pool their territories in an aggregate or collective land claim (Gordon et al. 2003). Some blocs include only two to three villages, while others are as large as twenty villages. In some cases, original “mother” communities gained satellites, or “daughters,” over time. In other cases, neighboring villages recently decided to cooperate in order to “scale up” their claim in front of state and non-state actors. During a land study carried out by the Central America and Caribbean Research Council (CACRC), the more than one hundred communities that participated formed seventeen multi-communal blocs based on historical relationships and the current desire to pool their claims to increase political leverage (Hale et al. 1998). The villages that rejected integration into a bloc often did so because of isolation, previous effective activism in support of land rights, or a history of conflict with neighboring communities.

The biggest and most powerful multi-village bloc in the RAAN is the Ten Communities. Each village has their own elder council, judges, and communal police, but there is a shared sindiko and sindiko council for the bloc (Proarca/Costas 1997). Firmly established blocs, like the Ten Communities and Karatá, whose daughter communities

are Lamblaya and Dagban, are expected to play a development role similar to the government by maintaining infrastructure such as roads (Alemán Cunningham and Barbeyto 2001).

Prinzapolka bloc formations are continuously evolving. The location of the blocs discussed below at the time of the CACRC study can be found in Hale et al. (1998) and Gordon et al. (2003). In some areas, land and lumber rivalries prevented cooperation among some villages or created shifts among blocs. Alamikangban did not enter into a bloc for the CACRC study. Their decision to make an individual claim was bolstered by their historical 1917 title to approximately 250 hectares along the Pía River. The total claim made by Alamikangban during the CACRC study was 98,190 hectares, which created overlap with the claims of neighboring villages.¹⁶⁴

The Prinzapolka villages of Buena Vista and Lagrikula make up the Supa Unta bloc, but there has been disagreement over the amount of corporate lumber extraction that should be allowed. There was also rivalry between Buena Vista and the neighboring village of Klarindan over mahogany (Hale et al. 1998). In the past, there was a shared extraction with up to fifty men from each village working. More recently, Buena Vista was in favor of rapid extraction, while Klarindan wanted to wait to the future until there were better prices. Buena Vista was motivated by a lack of trust in the government, who they felt might let logging companies enter if community members did not extract. This rivalry stopped the formation of a single bloc from Kuamwatla in the east to Klarindan in the west during CACRC participatory mapping in 1997.

¹⁶⁴ For additional information on the land claims of Alamikangban and other Prinzapolka villages and blocs see Hale et al. (1998), Gurdíán (2000), and Gordon et al. (2003).

The biggest bloc in Prinzapolka is the Siks Tawan, which is made up of six communities in the middle section of the Prinzapolka River, namely Limbaikan, Dos Amigos, Tuburus, Bethel, Auka Mango, and Galilea, which are governed by one sindiko. The formation of this bloc began in 1995. Auka Mango and Galilea are the two strongest villages. This bloc was seriously shaken in 2003 based on conflict over mahogany logging. The standing sindiko conceded mahogany from the land of other communities to an intermediary. These villages were in the process of establishing their own forest management plans through Limi-Nawâh.

Another large bloc is Kuambila, which is made up of the five eastern Prinzapolka communities of Kuamwatla, Prinzapolka Bar, Ariswatla, Sawmill, and Tawan Tara. Kuamwatla and Prinzapolka Bar are the original communities, and the other three formed as satellite villages. Kuamwatla holds a historical title to five thousand hectares and maintained dominance over other villages in Prinzapolka without titles, which had to pay annual tribute to Kuamwatla in return for land use. This practice continued until 1979.

Prinsubila and Isnawas, two Prinzapolka villages located along the Bambana River, make up the Wistan bloc. These villages lie at the interface between the Miskitu and Sumu-Mayangna cultures. Prinsubila's Sumu-Mayangna ancestors, the Prinsu, were the first documented inhabitants of the Prinzapolka area. Today these two villages are considered Miskitu, but they interact more with the Sumu-Mayangna villages to the north on the Bambana River, such as Wasakin, than the Miskitu villages along the Prinzapolka River. This bloc had conflict with the neighboring community of Layasiksa over lumber extraction (Hale et al. 1998).

At the time of research, Layasiksa, located in the northeast of Prinzapolka, was expanding its territorial claim. In 1997, the regional government recognized the village's claim to 36,000 hectares, although official titles were still pending. In 2001, a portion of village members moved from their main settlement near the seacoast to Layasiksa II, located further inland. A section of this population then moved on to Las Crucetas on the Prinzapolka River in 2002 and 2003. International donors helped settlers in Layasiksa I and Las Crucetas with housing and production projects.

Although Layasiksa I, Layasiksa II, and Las Crucetas are not an official bloc, this is one example of how villages grow and villagers disperse over time in a fluid and contested process (author's fieldnotes). Chapter Seven discusses the conflicts in Las Crucetas due to the initiating of a community sawmill on untitled communal land. In 2003, there was competition between WWF and Limi-Nawâh as both organizations targeted Layasiksa II's forests with different management proposals. Layasiksa II also had conflict with mestizo colonists. In 2004, there were incidences of murder, kidnapping, and destruction of property as villagers aggressively defended their land against non-indigenous colonists (Jarquín 2004a; Martínez 2004).

The following section addresses Miskitu self-governance at the village level. Household surveys I completed in Alamikangban in 2002 demonstrated a strong preference for self-governance. Forty-six percent of the fifty houses queried believed that natural resource decisions should be made in community assemblies, while another thirty-two percent believed that the sindiko and communal leaders should administer resources.

Governance structures have evolved within individual villages across the RAAN and leaders nearly always include the *sindiko* (common-pool resource overseer), *wihta* (judge), and elder council. These leaders are recognized by the regional and municipal governments and should be named and approved annually. Characteristics important in the nomination of a person to be a communal leader include being at least forty years old, having a good relationship with members of the community, being responsible and with good customs (often defined as not drinking heavily, being married, and being a church-going Christian), having the capacity to give good advice, being known, and having the economic resources to represent the community, since the position is officially unpaid (Proarcas/Costas 1997). Although literacy is not required, RAAN villages are increasingly selecting people that have attended at least one or more years of school. Inability to read and write, as well as communicate in Spanish, therefore, reduces the pool of candidates in some areas. Elite families, with historical roots in the village, tend to dominate leadership roles in Prinzapolka. This also limits the candidate pool.

The *wihta* applies internal rules and norms and manages conflict between members of the same community. The *wihta* may sanction minor criminals instead of involving state officials. A central government official told me that in the modern judicial system, the *wihta*'s role is seen to challenge the national constitution and state power.¹⁶⁵

Elder councils play an instrumental role in a wide range of decisions by giving moral advice. Strong elder councils have been known to remove other communal officials from power if they acted inappropriately. Yet, a member of the RAAN regional council recently stated:

¹⁶⁵ Pers. comm., Spanish, 12/06/02.

The elder councils do not have a defined role. They are static... Their role should be to use their experience, but what their experience now is war... The elders are not prepared to be guides. They are not changing with the times. They are not even making demands to the sindikos – this is proof that they are not fulfilling their role. They give away their signature for soda and tobacco. Often they can be bought with beer or offer of a job. Or they can be easily confused.¹⁶⁶

Community leaders often struggle for power over resource decision making. Sindiko roles permit considerable unchecked authority to a single individual (author's fieldnotes). The sindiko manages the important documents of his village, such as titles and maps, and has an official stamp to accompany his signature on legal documents. The sindiko is the most important village leader for forest management. With the recognition of autonomy in 1987, villages gained more control over communal resources. Since the sindiko oversaw land and resource transactions, the role of this leader was strengthened. Due to ability to grant natural resource extraction permits or sell land, the power of the sindiko grew. However, the Autonomy Statute focused on the creation of a regional administration and did not establish specific norms for communal leaders. Village governance structures are largely informal and much rule-making is left to the discretion of individual leaders. In some villages, a board of directors supports the sindiko, as state legislation deemed in the early 1900s, but these officials are not as powerful as the sindiko. In Alamikangban, this board appears to play mainly a token role. Members of the most important families rotate positions, including vice-sindiko, treasurer, accountant, and spokesperson, within the sindiko council.

An INAFOR delegate was critical of communal leaders.

We are trying to get sindikos to share stumpage fees equally with all community members. The sindiko usually gets the greatest economic benefit, and not the rest of the community. Once sindikos are in power, they think they are higher than the

¹⁶⁶ Pers. comm., Spanish, 07/10/01.

mayor and their people trust them more than the mayor. Sindikos allow cutting of mahogany by timber merchants even without permits.¹⁶⁷

He adds, “Many wood intermediaries are left in the street. Communities sell to two or three merchants and get money from both.” Jimenez continues:

When communities sign logging agreements, this includes ‘*cesión de derecho*.’ They are no longer the owners of the land [for the period of the agreement]...they do not have the right to sell to other people. Wood merchants talk to community members and say, ‘sell me twenty mahogany trees.’ Sindikos agree. People in the communities think, ‘The forest is ours and we can decide what to do with the trees.’ Even if they are the landowner, it doesn’t mean that they can do anything they want with the forest.¹⁶⁸

Sindiko positions have functioned over a different length of time in villages of Prinzapolka. According to Rogelio Torres, a previous sindiko of Alamikangban, “Historically, before the war, there were not a lot of sindikos in Prinzapolka...After the war, the [Sandinista] Front said that each community has to fight for itself. Now there are nine total [sindikos] in the municipality.”¹⁶⁹ Sindikos in Alamikangban started only in 1990. Torres states:

In the beginning, they used to stay for three to four years, now we are trying to regulate this so they only have the position for one year...The first sindiko was Jimmy Henders in 1990. Then came Alfredo Logan and this was when most of the mahogany was taken out. Later, Tacho Cisnero entered. The Cisneros say that all the land of Alamikangban is theirs so they put in a sindiko from their family. But he drank a lot.

In Prinzapolka, there is dominance by certain families. Many times, this hegemony is based on the family’s early settlement in or founding of a village. In Alamikangban, people related to Don Felipe “Tis” Cisneros’ claim to have greater land rights because he founded the village (Gurdián 2000). In some villages, the original land

¹⁶⁷ Pers. comm., Spanish, 03/11/02.

¹⁶⁸ Pers. comm., Spanish, 03/11/02.

¹⁶⁹ Pers. comm., Spanish, 06/25/02.

title of the community was granted in the name of an individual, as has happened with the Boudier family in Tungla. Non-indigenous people and recent immigrants hold less power within Prinzapolka villages.

There are risks entailed with communal governance when the judicial system is not adequate. Describing what happened to the sindiko Tacho Cisnero, Torres continued:

Victorino is a wood extractor working upriver. One time, the sindiko was there and one of his enemies killed him. Victorino stole the stamp of the sindiko and forged his signature and robbed four thousand hectares of land. He went to a lawyer with the false documents and had all the papers made up...Since the sindiko was dead, there was nothing to do to denounce him. After, there were groups of people taking wood from there. Victorino got the vast majority of the benefit. Later, the four thousand hectares of land were sold to [the logging company] PRADA.¹⁷⁰

In Prinzapolka, many sindikos and elders were either war heroes during the 1980s or have been active in the logging sector. Some are very skillful negotiators, while others lack the experience to negotiate with natural resource firms. While the sindiko may consult the elders and the wihta before making decisions, he can act without their support. In 2001, a member of Alamikangban's Elder Council complained:

The sindikos are stealing. They are aligned with the wood companies. They don't come to talk to us and ask what they should do and what agreement they should make with the community. If they do not come to talk with us, how can we give them advice? They are already grown up. We cannot force them to talk to us.¹⁷¹

Sindikos should be elected annually, but they often remain in power for longer, sometimes without the support of the community. In the most conflictive villages, even the discussion of candidates is divisive. The election process in Prinzapolka differs from village to village. In some, candidates and officials are chosen during a participatory

¹⁷⁰ Pers. comm., Spanish, 06/25/02.

¹⁷¹ Pers. comm., Spanish, 07/07/01.

assembly. In others, the elders handpick candidate(s) who will run against the current sindiko. Villagers then vote among these pre-selected candidates. It is not unheard of for individuals to claim that they are sindiko after gathering signatures of important community members. At times, leaders, such as pastors or municipal officials, may unduly influence the election process. Political parties want village sindikos to be aligned with them and outside institutions also pressure for election of candidates.

Due to the potential for power and personal gain, the competition to become the sindiko in some villages is excessive and conflict is extreme. A former Alamikangban sindiko notes, “Everyone wants to be sindiko. If we had a general public meeting, a group of youth would be difficult and are likely to threaten violence. The mayor and the elder council are deciding the candidates now.”¹⁷²

Although many sindikos begin with an intention to assist their community, they frequently become corrupt. Sindikos sign deals with logging companies and often do not share forestry concession information with other villagers. As sindikos gain access to financial resources from the sale of timber, they begin to prioritize extraction. Based on national law, a stumpage fee is paid for each tree taken from indigenous land. The manner that this money is divided within the community is inconsistent and in many communities, the full amount is paid to the sindiko. Historically, money from communal resources would be used to assist the neediest villagers, such as widows or orphans. A common complaint now is that the sindiko uses this money as a type of salary. According

¹⁷² Pers. comm., Spanish, 06/25/02.

to a RAAN regional councilor, sindikos do not look for alternative economic options because of easy money from logging or illegally selling communal land.¹⁷³

The system should allow for the removal of corrupt or ineffective leaders with yearly elections, but this process was never regularized in Prinzapolka (author's fieldnotes). Sindikos often hold power for several years, in spite of the fact that the annual permits supporting their administration from the municipal and regional government have expired. Villagers often wait for the standing sindiko to hold elections, an unlikely occurrence when he knows he will be replaced. Election Day is expected to be a large event and requires financial support to invite observers from the municipal government and provide refreshments. Sindikos often delay elections by claiming to be raising funds.

Although there is a degree of local independence evident in communal governance structures, and the above sections have clearly demonstrated agency on the part of individual leaders, there are international donor, state, NGO, and corporate influences on village processes. For example, the central government has recently worked to strengthen state institutions in the RAAN and permanent police and army are stationed in Prinzapolka. This challenged the role of the wihta and the elders, who are now only allowed to resolve small disputes or assist state officials.

Central government agencies justify the appropriation of international finances for Miskitu populations due to village governance problems. Donor representatives with experience in the RAAN often felt cynical about working with sindikos after observing

¹⁷³ Pers. comm., Spanish, 07/10/01.

donated materials being misappropriated.¹⁷⁴ They may not respect village governance structures or decision making as a result. During fieldwork, some donors even refused to work in Prinzapolka until governance improves. Nevertheless, some groups did work in the municipality. The training and accompaniment of local leaders by national NGOs and international aid agencies has been a core reason for increased acceptance of village communal officials on the part of state officials at various governance scales.

In Prinzapolka, there is conflict among development projects supporting alternative models for local participation. While there is widespread concern over sindiko corruption and illegal land sales, there is disagreement over reform. Should customary structures be left in place and individual leaders be encouraged to improve? Or, would a council or more participatory structure be more conducive to the defense of village rights? *While it is arguably the right of indigenous populations to make decisions about self-governance structures, the choices that they make have profound implications for the implementation of donor-instigated development projects*, as will be seen in the case studies in the following chapters.

Core elected communal officials, such as the sindiko, wihta, and elder council, are practically always men. Less powerful leadership positions, such as the sindiko board of directors, are open to a woman. Elected women leaders often come from the same dominant families as male leaders. At the time of research, unmarried, middle-aged women were the most likely to hold community positions in the study area.

¹⁷⁴ Pers. comm., Spanish, various.

All three of the transnational development case studies presented in Chapter Six influenced gender roles in Miskitu villages,¹⁷⁵ demonstrating the interplay of prejudices between different scales. One development proposal would establish a small female-run business. In another, a woman was the leading representative in a village corporation. In the last, a multi-village logging corporation, gender quotas for activities were established and women board members were strongly encouraged. Donors required equitable participation, but the project faced resistance at the local level because women were historically not involved in many forest sector activities.

International donors desire transparency and democracy in order assure proper management of financial assets. Informal, hierarchical Miskitu structures do not always meet these expectations. The dominance of male leaders does not meet global standard for gender equity. Some development projects encourage the adoption of national or international governance standards and, therefore, change the scale and role of customary leaders. *Without arguing for or against specific governance attributes, should outside standards transform local indigenous practices?*

Village leadership change is a conflictive issue. Leadership transformation cannot be imposed from outside, but foreign networks have been able to influence structures by either creating new leadership roles or reinforcing existing ones. Nonetheless, entrenched power relations and inequitable access may remain embedded in new natural resource

¹⁷⁵ Even without foreign intervention many Miskitu women have been politically active since the 1980s. A wave of female village leaders began during the war when men were absent. Some anthropologists, such as Helms (1971), historically defined the Miskitu as a matriarchal society. Strong female roles were attributed to male absences during migratory logging and mining employment.

regimes (Bryant and Wilson 1998; author's fieldnotes). Moreover, donors are not always sufficiently connected to local populations to judge the appropriateness of their alliances.

In the names of 'pluralism' and 'civil society,' development institutions and nongovernmental organizations (NGOs) appear to be choosing to transfer powers to less-than-democratic 'traditional' authorities, committees, and local NGOs, either due to a naïve populism, an uncritical acceptance of everything 'indigenous' or an anti-government stance...The convergence of these anti-democratic tendencies is causing a potentially destructive proliferation of local institutions (Larson and Ribot 2004: 6).

Decentralization does not guarantee democracy, pluralism, or rights. Power may be transferred to undemocratic local organizations and leaders. Conflict among various institutions may impede coherent governance.

CHAPTER SUMMARY

Nicaragua has an historical tendency towards extreme centralization. Decentralization is still new. Social and political elites have had the skills and assets necessary to take advantage of opportunities opened by the process of decentralization. Although local institutions have begun to develop, often with the assistance of international donors, they often mirror the vertical structure of the national state. Sharing power is resisted at every level of governance, even within communal leadership.

My findings suggest that while there is considerable power at higher scales, lower level activities sometimes contradict and counteract reforms or programs. *This research shows that interplay between scales is a highly complex process.* The case of Prinzapolka demonstrates that it is hard to shift scales, create new institutions, and to synchronize changes at multiple governance levels. In spite of these constraints, actors at multiple intermediary and local scales exhibit elements of decision making power and agency. The

case studies in the following two chapters also demonstrate how Nicaraguans choose different roles, although foreign influences are also apparent.

CHAPTER SIX

Transnational Development in Alamikangban

This chapter tells the story of three socio-ecological projects that initiated work in Alamikangban between 2002 and 2003. Each project aspired to integrate social, economic, and resource development using horizontal and vertical institutional linkages and upward and downward scale shifts. The first project discussed is the Alamikangban Community Genetic Reserve and Seed Bank, which is a village-based corporation for Caribbean pine seed harvest, processing, and sale. The second case study is the Limi-Nawâh Corporation, which is an indigenous-to-indigenous joint business venture between populations in Canada and villages along Nicaragua's Prinzapolka and Bambana Rivers. The last case is the Atlantic Biological Corridor (ABC), a section of the larger Mesoamerican Biological Corridor (MBC).

Three initial stages of transnational organizational penetration are conceptualization, negotiation, and implementation. During conceptualization, there is formation and expansion of the institutions involved. In each case study, major implementing institutions formed in the decade prior to implementation. Negotiation stages involved the definition of project structures, governance scales, and leaders. Various scales can interact to advance or delay a project (author's fieldnotes). During the implementation stage, tensions among villagers and between villages may increase as resource sharing, equity, and benefit are determined.

The three core case study projects each have roots dating back two decades. In the case of the genetic reserve, there was a seed extraction and banking project in Alamikangban during the previous decade, although the institutional structure was

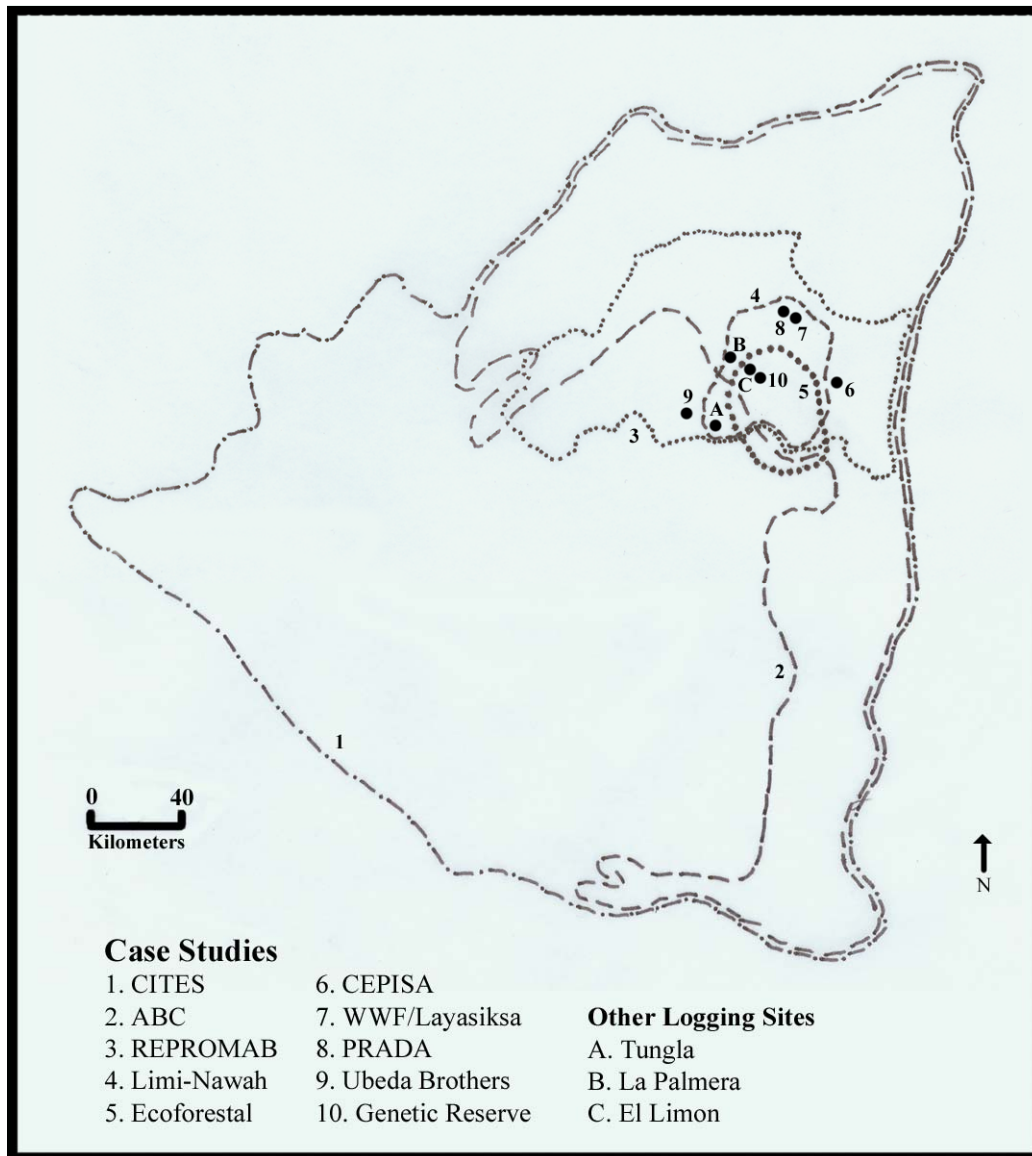
considerably different because it was not village-run. The Limi-Nawâh model was first developed by Meadow Lake Tribal Council (MLTC) in Canadian before being exported to Nicaragua. The creation of the larger MBC was a precursor to Nicaragua's ABC, as was the creation of individual protected areas and becoming party to the Convention on Biological Diversity.

Although all three cases involve the village of Alamikangban, the projects range in spatial extent, as can be seen in Map 2. The Seed Bank worked only in Alamikangban on a small portion of its communal land. Limi-Nawâh is meso-scale. In 2003, it involved fifteen villages in two municipalities. The number of villages and land area increased in 2004. The ABC included a total of fifty-three villages in three RAAN municipalities and thirty-seven villages in five municipalities of the RAAS. In the latter two cases, the project is analyzed as it pertains to Miskitu villages in the municipality of Prinzapolka.

The focus of this work is the initial incursion of transnational development projects into indigenous villages. Due to the dynamic nature of human-environment interactions, there have been institutional and spatial changes since the fieldwork period. Any description or analysis of these case studies is based on 2002 and 2003. The elements described may have since changed.

MAP 2

Forest Development and Extraction Case Studies, 2002-2003



Case study projects advanced in spite of land tenure insecurity. My fifty household surveys completed in Alamikangban prior to the entrance of most of the case study projects demonstrate the importance and complexity of the land tenure situation. Table 9 shows the different land tenure conflicts perceived.

TABLE 9

Land Tenure Conflicts, Household Survey, Alamikangban, 2002

Conflict	Respondents Identifying Conflict
Within the village	64%
With mestizos	64%
With foreigners	50%
With the central government	42%
With communal leaders	38%
With the municipal government	26%
Indigenous land sales	22%
With companies	16%
With the regional government	10%
With other municipalities	8%
With other communities	6%
Lack of demarcation	4%
Maldistribution of land	2%
None/No land tenure conflict	0%

I obtained this list by asking respondents to identify any and all land conflicts involving their communal land that they were aware of. The conflicts listed ranged widely in spite of the fact that the land being discussed was the same. It is notable that

sixty-four percent identified tenure conflicts within the village.¹⁷⁶ This is far from an ideal context for project development.

CASE STUDY ONE: ALAMIKANGBAN COMMUNITY GENETIC FOREST RESERVE AND SEED BANK

The 1,100-hectare genetic reserve for Caribbean pine was the smallest case study. The reserve allows for *in situ* conservation. Based on Oxford Forestry Institute seed samples in the 1970s, the Alamikangban pine plains are known worldwide for high quality genetic stock for lumber production (MARENA-DANIDA 1994).¹⁷⁷

This project proposal discussed non-paternalistic aid with the creation of a community firm: village members would learn to run a business that could provide employment as well as income for their own social service investment. Income would be generated from the collection, processing, and sale of pine seeds. The goal was international certification of the quality of seeds as this was predicted to open markets. Seeds could also be sold to future reforestation projects within the nation.

This case study involves the reintroduction of the seed bank into regional, national, and international policy circles. The project was granted funding and a multi-scale directive committee with its base in the RAAN was proposed. It was expected that implementation would follow shortly. Although there had been progress by the end of my

¹⁷⁶ Villagers sometimes complained that communal land was insufficient, particularly due to population growth and intergenerational inequity. In a 2002 survey my fieldwork assistant and I administered in Alamikangban households, thirty out of fifty families believed that they did not have sufficient land to use. This complaint was especially prevalent with younger generations and among new heads of household.

¹⁷⁷ Oxford Forestry Institute took seed samples in Belize, Guatemala, Honduras, and Nicaragua (Gibson 1994). The results from the Caribbean pine studies were published in Greaves (1978). Thirty-six sites, including Alamikangban, were used to analyze this species.

fieldwork, such as the establishment of initial village leadership, the project experienced a series of delays. There was a steep learning curve for regional institutions, which previously did not have experience with genetic reserves or seed production. Although pine has been extracted from the RAAN for centuries, most pine companies in the area were managed by foreign experts. During fieldwork, regional foresters were still considered inexperienced in pine management. National technical experts from other pine-producing regions were employed in many pine companies, including Hernandez's logging operation located in the plains outside of Alamikangban. Alamikangban's genetic reserve project represents a transition towards regional pine resource administration.

Conceptualization Stage

Alamikangban's forests have been written into state development plans numerous times. Most projects were not implemented. Private companies did extract resources. Logging in Prinzapolka was particularly intense between 1945 and 1964 (Malefant 1993). Foreign companies harvested pine for export, but did not invest in the infrastructure to process lumber. Trees were exported as logs or merely squared into timber. The forestry peak ended due to the exhaustion of economically profitable trees.

With technical and planning assistance from the Swiss government in the 1980s, the Sandinista Administration had high hopes for RAAN forestry sector. In the late 1980s, Alamikangban hosted a small seed processing facility and bank. In 1985, consultants studied Alamikangban as a seed collection site and the infrastructure was built in 1987. The ex-project administrator, María Masanto, recollected, "Nobody dared to enter at this time, but we entered even though it was a time of war."¹⁷⁸ With support

¹⁷⁸ Pers. comm., Spanish, 12/12/02.

from the Danish International Development Assistance and Nicaragua's Institute of Environment and Natural Resources (IRENA), the project commenced extraction in 1988.

Annual seed collection occurred between April and July (Malefant 1993). There was a peak of fifty to sixty men employed to harvest. The seeds were brought in green. Approximately fifteen women were employed to dry and process the seeds, and four men worked the heavy equipment. The cones were rotated to dry evenly and rubbed together to extract seeds.

A genetic improvement center was founded on the other side of northern Nicaragua in León in November of 1991. María Masanto was the director. This case study demonstrates the instrumental role of a particular individual because the project blossomed under Masanto, who seemed to embody passion for RAAN forest development when I interviewed her in 2002 and 2003. León's gene center incorporated the Alamikangban seed bank as one of four substations. The center stored seeds from the four pine species in Nicaragua, along with other native and non-native trees (Urbina 1994). Seed research and banking required high investment in the León facilities. Rigid environmental conditions are necessary for quality seeds.

When the initial processing and drying were completed in Alamikangban, the seeds were quickly sent to León to be placed in cold chambers. The laboratory in León followed strict standards from the International Seed Testing Association. Seeds were tested for moisture content, purity, weight, and germination. Seeds sold nationally were certified based on quality and origin. Exported seeds were certified for proper phytosanitation. According to Masanto, the genetic improvement center was gaining an

international reputation for excellence.¹⁷⁹ After several successful years of collection, the project was looking to extend its RAAN activities to other parts of Prinzapolka (Malefant 1993) or another RAAN municipality.¹⁸⁰ There was also a call for more local participation in Alamikangban (Malefant 1993). Although villagers acknowledged in 1993 that it was difficult for the project to work in a community without clear leadership, they criticized project administration for only involving them as a labor force and not in management decisions. Complaints also arose from the lack of a written agreement between the workers and the administration. There were misunderstandings. For example, former employees still complain that the project did not accept all the cones they harvested.¹⁸¹ Following strict standards, the gene center only paid for high quality cones (Malefant 1993).

Seed bank managers were concerned that people from Alamikangban carried out activities in the forest incompatible with *in situ* conservation and the collection of seeds. Some village members saw the growth of pine forests as an obstacle to cattle ranching and lit fires to provide pasture. Some employees used work equipment for reasons other than seed collection, such as climbing trees to capture baby birds to sell (Malefant 1993). These issues were never resolved. According to Masanto, in 1994, a series of tropical storms impacted Alamikangban. Since cones rot in high humidity, annual collection was not completed. In 1995, there were many fires between February and May, leaving few acceptable cones. In 1996, Masanto left the project. It floundered under the next director, a lawyer without a background in forest sciences, who was chosen by the Nicaraguan

¹⁷⁹ Pers. comm., Spanish, 12/12/02.

¹⁸⁰ Pers. comm., Spanish, 12/12/02.

¹⁸¹ Pers. comm., Spanish, various.

president. Abandoned since 1997, the Alamikangban infrastructure has been disintegrating. Later, the León Genetic Improvement Center closed as well, although the possibility of its reopening remained.

In the late 1980s, Masanto and other forest experts proposed a reserve in Alamikangban on the grounds that this was the best Caribbean pine forest existing in Nicaragua.¹⁸² Although the reserve was formally instituted in 1991 under Chamorro Administration, the boundaries were still not clearly established at the time of fieldwork. This void created serious delays for projects involving Alamikangban's pine plains, as evidenced by the first two case studies in this chapter.

Negotiation Stage

A newly formed Secretary of Natural Resources, Production, and Territorial Demarcation (SERENA) of the RAAN Regional Council wrote a proposal in June of 2001 to reinstitute the seed bank. Councilor Jimmy Webster was the force behind reinstating this project. Webster went to Alamikangban and spoke to a small group of community members who confirmed local interest. SERENA wrote up the project with the Bluefields Indian Caribbean University (BICU). The Bilwi campus of BICU provided administrative and technical support to the reserve and seed bank.¹⁸³

In 2001, SERENA and BICU presented the project to a new Forestry Promotion Project (PROFOR) in Managua, which was under the direction of the Ministry of Agriculture, Livestock, and Forests (MAG-FOR). PROFOR, funded predominately by the World Bank, was sponsoring projects selected by a board of directors with members

¹⁸² Pers. comm., Masanto, Spanish, 12/12/02.

¹⁸³ BICU is one of two Autonomous Region universities founded since 1990. Both have become instrumental in the management of marine and terrestrial resources.

from various state commerce and resource agencies, as well as the private Forest Chamber. María Masanto, the former project director, was then working for PROFOR. It was partially due to her influence that PROFOR decided to fund Alamikangban's new seed bank project.

The duration of the original project as approved by PROFOR was sixteen months. The stages included writing a forest management plan, training local populations to manage and execute the project, initiating the collection, classification, and certification of seeds, selling seeds to national and international markets to bring community income, and establishing seed orchards. The SERENA proposal required the general restoration of existing infrastructure. The seeds were still to be sent to León after initial processing. Community participation focused around fire control, forest inventories, and seed collection.

There were significant differences from when the Seed Bank functioned previously. First, the project had sponsorship by the regional government along with the central government. Regional representatives hoped that the creation of a successful project would, in turn, strengthen the RAAN regional government, as well as build resource management capacity within the autonomous region. The inclusion of BICU, a regional university, supported this aspiration.

Second, the forest product market had changed and the project wanted to be poised to take advantage of current trends. While the León Genetic Improvement Center certified seeds under a national process, this project would pursue international certification. With increases in international plantations over recent years, it was hoped to

export much greater quantities than the previous initiative. Caribbean pine had become popular for industrial plantations.

Although PROFOR approved the genetic reserve, with RAAN regional government elections on March 3, 2002, and a subsequent change of administration in May, there was a substantial delay in bringing the project proposal to Alamikangban. The functioning of the RAAN regional government was limited during a chaotic transition of power between administrations

In October of 2002, representatives of the regional government and BICU held a meeting in Alamikangban to inform community members about the project, governance structure, and donors. They explained that the initiative included a small business that would be run by local populations, with initial accompaniment. Regional officials stated that the project would begin in 2003 and that the villagers had to choose a project representative to communicate village interests during the project initiation. The project's directive body, managed from the regional capital, would include a representative of the RAAN government, two representatives of BICU,¹⁸⁴ one Alamikangban representative, and a representative of MAG-FOR/PROFOR.

The initial community meeting was not well organized, but it had lasting implications because of the selection of this core representative, who was listed as the project owner on the state forest management plan. Officials from the regional institutions showed up in Alamikangban one Sunday morning without warning and, twenty minutes later, the meeting began. A large portion of the community was in church, including the village natural resource sindiko, James Rogers. During recent

¹⁸⁴ One was the field technician and the other represented the university.

previous communication with the regional government, Rogers was asked to nominate a person to represent the village on the seed bank board; he selected himself. Bilwi project leaders later decided to have a more democratic selection process. The sindiko should immediately be called to all meetings on natural resources. Since Rogers could have attended a church service later that day, the fact that no one rushed to give him a message in church, located just meters away, may have been related to his poor leadership. Rogers had not held elections during the previous year, as he should have, and many were critical of his actions as sindiko.

At this meeting, several potential representatives were nominated. A woman named Marlene Blas received the most votes of the two dozen villagers present. Female leadership is rare in Alamikangban and three factors were likely to have contributed to her selection. First, in the period before the election, there was evidence of corruption on the part of many of the standing male leaders, which might have made people more open to new leadership. Second, Blas was one of the few women in the village who had gained position in the political sphere. She was active in the indigenous resistance during the Civil War and was a member of the board of directors of the Prinzapolka Project, a multi-village NGO development initiative. As such, she had received training and experience in community leadership. Third, she had been a previous seed bank employee and, therefore, was experienced. Processing seeds for the earlier project may have been the only time women were involved in forestry activities in the history of the community. Forest extraction is predominately seen as a male domain.

After the departure of regional representatives, village men stayed at the meeting site and gave Blas advice in a paternal fashion about how she should act in relation to

actors at higher scales. This involved the telling of numerous stories highlighting their own interactions where they focused on their own wisdom and strength while representing village interests. Some men demonstrated concern about Blas' ability to organize other villagers and strongly represent village needs. She, herself, was nervous about her ability to do the work as a single mother with three children.

The administrative board began to meet regularly in Bilwi. The RAAN government simultaneously held meetings with WWF and representatives of Layasiksa village on another community forestry project. Blas attended a percentage of these meetings. Poor transportation and communication infrastructure limited her interaction with the regional capital. The deterioration of the roads during the rainy season made travel especially difficult. One time Blas arrived at the capital and the meeting had already taken place. On another occasion, she was not issued an invitation because she would have traveled for days to attend what was expected to be a very short meeting.

While there were concerns over local representation in regional structures, Blas played a central role in the organization of a workshop fire control in Alamikangban in April of 2003. Invitations were issued to twenty-six people, but forty-five arrived, which Blas felt demonstrated high levels of community interest in the project. Blas noted that men were predominately invited because they are the ones "who go to the pine plains."¹⁸⁵ At this event, a community directive board was selected. People who did not attend the meeting, therefore, had no voice in the selection of leaders for a communal project. Board members would have leadership roles and potentially distribute community resources, but

¹⁸⁵ Pers. comm., Spanish, 05/12/03.

they were selected by members of less than thirty percent of the households.¹⁸⁶ The selection of the participants to attend the meeting was even more limited as Blas and a few other community leaders, through informal dialogue and word of mouth, decided who would be invited. There was also a degree of self selection. Some community members only attended a meeting if they had a written invitation in hand. Others presented themselves if it was informally mentioned that they should attend, or because they became aware of the meeting and felt that they should attend.

The training was organized by national representatives from PROFOR, including Masanto, who ran the workshop, as well as officials from BICU, SERENA, and the RAAN government. One village attendee stated afterwards:

People didn't know how to maintain the forest. Now we know how to care for it. We realized that we are destroying resources. We burn the seeds and destroy their potential for sale. Animals run from fire and will go to another forest if we are burning.¹⁸⁷

Another participant stated:

This regional government wants to be different from those in the past. They said that in the past the project used to take the seeds and go, but now it is going to be a community corporation. When people think of company, they think that it is going to come from outside, but they explained that this is our company. We are the owners.¹⁸⁸

The first harvest was scheduled to take place from May until July of 2003. According to the initial project director, associated with BICU, it did not occur for two unrelated reasons.¹⁸⁹ One problem was fire damage. Some community members

¹⁸⁶ Assuming there was no more than one representative per household at the meeting.

¹⁸⁷ Pers. comm., Spanish, 05/13/03.

¹⁸⁸ Pers. comm., Spanish, 05/11/03.

¹⁸⁹ Pers. comm., Spanish, 11/03/03.

continued to burn to encourage palatable grass for deer and cattle, make it easier to hunt and gather, and because a burned area was perceived as cleaner. In household surveys I did in October of 2002 in fifty Alamikangban households, eighty percent of respondents thought that the pine savanna should never be burned. Another eight percent thought that it should be burned every five years, and four percent thought that it should be burned every ten years. Only eight percent thought that it should be burned annually, but this is the situation that prevails. Although burning in 2003 initiated before the project's April education campaign, villagers continued to burn after the Alamikangban workshop had set up patrols and trained people. As a result of the burning in 2003, BICU and SERENA project leaders, previously unfamiliar with the local geography, learned they would need to dig wells in specific locations if they were to combat fires in the future. There was no water in many creeks near Alamikangban in the peak of the dry season when the fires occurred.¹⁹⁰

The second problem was setbacks obtaining materials. Supplies that were to be imported from a donor country were delayed due to the lack of clarity in a decision making process at the regional and national scales related to the exoneration of import taxes. Other materials were to be purchased with PROFOR funds. A project administrator noted:

The World Bank is so demanding in its technical specification that it has made things nearly impossible for a project learning as we go. They want us to define the size of the screw if we are asking for screws. They want us to define the thread that we will be using in making pants when people here are only certain that they need pants.¹⁹¹

¹⁹⁰ Pers. comm., Spanish, 11/03/03.

¹⁹¹ Pers. comm., Spanish, 11/03/03.

A regional government representative concurred, “If one technical detail is off, then the whole proposal is rejected.”¹⁹²

Before purchasing each product, it was expected that administrators would get three competitive estimates and choose the supplier with the lowest price. However, it may be impossible to find three suppliers willing to work in Prinzapolka based on transportation conditions. Sometimes it was impossible to even find three suppliers for an item in Bilwi. Based on her experience from working in the RAAN, Masanto also notes, “These are not the same conditions working in the Atlantic and the Pacific. You have to pay for price quotes in [Bilwi]. This cannot be written into the budget and so it means that people have to pay for it themselves.”¹⁹³

Although some individual representatives in Managua understood RAAN challenges, most were too distant from the region to comprehend the extreme difficulties imposed by bank standards. Prices in the region were outrageous when compared to Managua, and technical products were difficult to obtain, especially when trying to meet a strict project timeline. However, when regional officials explained this to national counterparts, they felt like they were not believed. A project administrator stated, “When people from here tell them the local reality and the costs of transportation, they think that we are lying and only trying to get more money out of them.”¹⁹⁴

In spite of delays, some aspects of the project advanced. A RAAN forester, Tomás Taylor, was hired to write the forest management plan, which was entitled “*La Pista*,” due to the location of the project surrounding the historical Alamikangban airstrip.

¹⁹² Pers. Comm., Spanish, 11/05/03.

¹⁹³ Pers. comm., Spanish, 12/01/03.

¹⁹⁴ Pers. comm., Spanish, 11/03/03.

As shown below in Table 10, in 2003, there were no areas of young forest, and apparently no regeneration since 1987.

TABLE 10

Forest Composition of the Reserve Area

(Tomás Taylor, unpublished field data recorded in April of 2003)

Age Class (years)	Last Year Logged/Cleared	Development Stage	Area (hectares)	Percent of Total
0-2	2001-2003	Area without forest ¹⁹⁵	52.9	4.8
3-8	1995-2000	Regenerating	0.0	0.0
9-16	1987-1994	Young	0.0	0.0
17-32	1971-1986	Developing	13.6	1.2
33-40	1963-1970	Mature	1,025.9	93.9
41+	before 1962	Mature/Old	0.0	0.0
Total			1,092.4	100

Regional and national foresters believed that the lack of regeneration, as evidenced in the absence of trees in the age classes between three and sixteen years, were due to the annual burns, which killed seedlings (Taylor 2003). More than ninety percent of the trees sprung up after the last corporate clear-cut between 1963 and 1970.¹⁹⁶ The details on this extraction and the smaller area harvested between 1971 and 1986 are

¹⁹⁵ These deforested areas include the road and an open grass runway for airplanes, where cattle graze.

¹⁹⁶ No trees were believed to be over forty-one years of age. The remaining forest was not structurally complex and there was a lack of old-growth trees in various stages of decomposition to host flora and fauna utilizing this type of environment.

unclear.¹⁹⁷ It appears that after these harvests, there were fewer or less intense fires, fire suppression, or the seedlings survived in spite of fires, as I have not heard of any deliberate reforestation in Prinzapolka at any point in history before 2001.

The forest management plan specifically targeted genetic improvement and the production of certified seed. The rotation period would be thirty-six to forty years. Larger trees would produce seeds, but all trees would be cut in a rotation so that production levels are kept high. Approximately ninety-five percent of the area would be harvested, excluding the approximately fifty hectares without trees. Management activities would include fire control, with the construction of firebreaks and establishment of patrols, and reforestation, which would require manual and mechanized scarification to assist seed germination and clearing to remove competing plants, shrubs, and trees. Taylor (2003) proposed that prescribed burns would be maintained, depending on forest density and regeneration rates.

A genetic diagnosis Taylor (2003) carried out on 671 trees gave an idea of the forest composition.¹⁹⁸ Four seed procurement areas were then selected. Superior parent trees were considered to be those that had a straight, thick trunk, a nice branch angle and form, and a vigorous crown. Genetically inferior trees would need to be eliminated so they could not contaminate these chosen plots and so as to encourage the reproduction

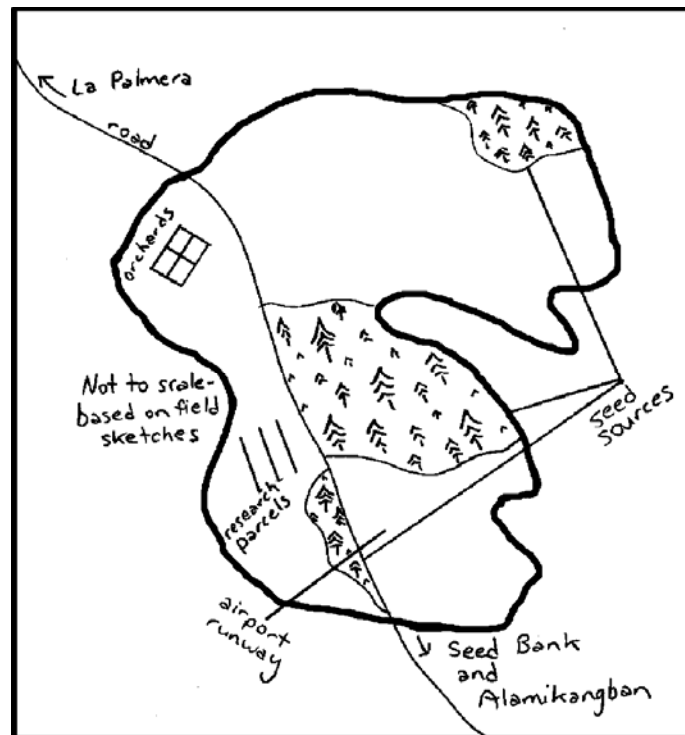
¹⁹⁷ The Alamikangban residents I interviewed remembered conflicting dates and companies. Malefant (1993) mentions that Waddell's Prinzapolka Company harvested the plains from 1948-1962 and continued supplying its mills in Rosita and Prinzapolka in part with pine from Alamikangban until 1977-1978. These dates roughly match Table 8.

¹⁹⁸ Of the trees analyzed, approximately twenty-five percent had cones present on bundles and nearly seventy-five percent did not. Around ten percent represented appropriate gene donors due to good form and development, but some of these had been damaged. Of the damaged trees, nearly forty-six percent were harmed by fire, twenty-two percent by termites, and eighteen percent by excessive resination.

and growth of those with higher genetic quality. Undesirable trees would be converted into lumber for local use or sale (see Map 3).

MAP 3

Proposed Genetic Reserve, 2003



Of different protected area sub-types, the extractive reserve is particularly linked to markets. Extractive reserves are popular due to the potential to conserve tropical forests while providing income to local populations (Ghimire and Pimbert 1997). If subsidies are not provided, these reserves may rely solely on markets to create effective incentives for the valuation of products collected by local people. There are several concerns. First, this market-driven framework does not seek to support or strengthen local institutions and often needs to be partnered with broader programs for this to occur. Second, local traditions of reciprocity and self-reliance may be weakened during

extraction for export markets. Third, unstable resource markets may make extraction inherently risky and local populations usually continue to be dependent on raw materials. Fourth, extraction may degrade surrounding ecosystems. Once this structure is in place and has replaced other production options, what happens if the extractible commodity becomes diminished or unavailable? In the case of the Alamikangban project, one fire could destroy seeds for the annual harvest. During initial years, the seed bank had been unable to harvest during the most humid years as the cones rotted.

The “genetic reserve” is not a category recognized in the IUCN protected area framework and, as envisioned in Nicaragua, it would not meet the requirement that the majority of area is left in a natural state. The Nicaraguan case study exemplifies an extreme form of market valuation because managers will deforest stands not considered of the highest quality in order to protect the value of selected prototypes. All of the trees would be logged within the forest reserve during the forty-year rotation period. Most would be harvested immediately, which creates a question about the inclusion of the area as a national “protected” area.

The official state forest management plan was completed in August of 2003. One of the final steps was municipal government approval, which was required for INAFOR permits. This occurred on August 21, 2003 and was the only municipal involvement in the project during fieldwork. The forest management plan then passed to the regional government and to PROFOR. After these institutions gave their stamp of approval, it passed to INAFOR. Here the permitting process was delayed due to the lack of clarity of the Alamikangban Forest Reserve boundaries. If the management plan were to be located within the reserve, approval would be necessary from the Ministry of Environment and

Natural Resource (MARENA) instead of INAFOR. INAFOR and MARENA did not want to give approval, and then find out that the plan was not under their jurisdiction. The classification of the protected area also needed to be clarified; it had received alternative listings, which restricted different potential human activities.

Another challenge arose from the change in the administration within PROFOR. The pre-2003 representatives were more understanding, a BICU forester noted, but in 2003, “They are being very rigid and they want everything by the book. People in the RAAN are trying to follow their requirements, but we need a little bit of flexibility here and there due to the situation in the region.”¹⁹⁹ There were also administrative changes in MAG-FOR, which became more centralized because it was consolidated to have one administrative unit. Since there was fewer staff, the ministry worked even more slowly. Switches in administration of state offices in Nicaragua often have an impact on the implementation of their programs and projects. In this case, the switch may have made functioning more difficult. In case study three, in contrast, the change of administration appeared to have positive implications for the advancement of the project.

The main project head in Bilwi admitted that it had been difficult for the administrators to access Alamikangban and that there had been execution mistakes leading to delays in receiving the funds that were initially approved.²⁰⁰ Along with stalling the implementation of the project, this created problems for Blas as the village representative. In late 2003, Blas waited for reimbursement for two weeks in Bilwi due to the slow dispersal of funds from Managua and lack of financial liquidity in the regional

¹⁹⁹ Pers. comm., Spanish, 11/03/03.

²⁰⁰ Pers. comm., Spanish, 11/03/03.

government. Other times, she missed meetings because she was not advanced travel funds and could not afford to get to the RAAN capital.

There was added urgency to initiate the project due to the pending termination of PROFOR. The original schedule for PROFOR completion was August of 2003, but this was later extended to December. In October of 2003, three important project steps still needed to be completed – the legal creation of the constitution of the community firm, the approval of design of the infrastructure, and list of materials,²⁰¹ and the acquisition of some supplies.

Any of the forty-six national PROFOR sub-projects that did not fulfill requirements by the end of December would lose the funds allotted to them. In October, when BICU and the regional government leaders broached the topic of a project extension, they were not given much hope. They were told that they would need to write to administrators in MAG-FOR and the World Bank pleading their case.

Based on my evaluation, a major constraint was the lack of experience in the RAAN with international development projects and the management of genetic reserves. Regional leaders tried to gain knowledge through consultations with specialists, such as representatives of international environmental organizations like the WWF. Pine reproduction with genetic improvement would be challenging for novice practitioners. Moreover, fire protection in order to assure cone harvest may be difficult given the interrelation between fire use and the local culture.

²⁰¹ There was a technical problem with the original plans because they did not have the required measurements. They were rejected at the national level. An architect later drew up new plans.

Another central problem in my opinion was the lack of experience in community forestry at all levels in Nicaragua. The approved project proposal required the purchase of materials, but there was not an organized village group with which to leave them. Without a central institution to take responsibility, regional representatives felt that they could not take supplies to Alamikangban and say that they “belong to the community.” Regional representatives apparently did not think about this when they wrote the original plan. Administrators later faced a lengthy process of consultation to define how to get around this problem and establish a small firm, where a group of villagers run the company, but are directly accountable to the community. This structure was still not functioning at the end of the fieldwork. The project administrator explained, “If a project wants to do community management well, then there are a thousand steps to initiate. Private companies can work much faster, within six months they are already harvesting.”²⁰² Community processes are more complex and this representative felt that they were not to be facilitated by the Nicaraguan government the same way that a private process often is.

Additional project fundraising created an additional challenge. Based on the proposed plan, the costs from fire protection and forest management, such as silvicultural treatments, were predicted to be initially higher than profit. The project was expected to initially operate at a financial loss. Once production began, there would be other complexities, such as warehousing, creating markets, and sales. At the time of the fieldwork, the León center was closed and could not assist Alamikangban as it had before. Dry, low temperature storage was unobtainable in Alamikangban during

²⁰² Pers. comm., Spanish, 11/03/03.

fieldwork as there was no electricity and the average monthly humidity was often above eighty percent.

The project plan attempted to set up a project like the previous one. This did not take into account that the first seed bank was covered by a state ministry, while this community-based project would require a much different structure. Although the new project was associated with MAG-FOR, the role of Managuan agencies was primarily to serve as a go-between with the project and donors. Comments from regional officials suggested frustration that the national government often publicized the fact that it had a seed project, but it did little to facilitate initiation.

As PROFOR ended in December of 2004, a new two-year program for indigenous forest management with international donor support was announced. At the end of the fieldwork, it appeared likely that the RAAN PROFOR projects that had begun would be placed under this new initiative, the Office for Promotion and Investment in Sustainable Forestry, for an additional six months. Even with the time extension, the seed bank project faced what appeared to be a potentially unrealistic timeframe. The involvement of some actors was only intended to last during initiation. BICU initially committed to provide support for sixteen months until it was believed that the local population would have sufficient capacity. Since the only local decision making that occurred in the first two years was the selection of village representatives, local populations would need considerably longer to take control of this project. As long as administration remained at the regional, national, and international levels, the local population would not gain experience in management decisions. If the regional representatives with forestry degrees would take longer than sixteen months to learn how to advise and support the project,

how then would villagers with even less training assume command and begin implementation in the near future? This project demonstrates a potential mismatch in early project stages between technically sophisticated seed production and villager experience and capacity. Courses in business administration and seed processing could have initiated in initial project stages so that when the infrastructure was prepared for the first harvest, the local administrators were already to begin decision making, hire seed collectors, and start production.

The genetic reserve and seed bank did not begin implementation during my fieldwork. If the community seed collection commences, this would be an instructive case study to continue to observe. Additional political challenges are likely to surface. The project experienced limited conflict during fieldwork, but there has been little local competition over power or benefits. Alamikangban is notorious for embattled forest management and leadership debates. Masanto recalls, “The community is conflictive and this is why they have not received funds [from the state and donors]. Also, they are not organized...If they fail with this project, they will always fail. Even the Red Cross has pulled out.”²⁰³ Case study two demonstrates some of the types of controversy that may emerge when resources begin to flow and development projects try to organize village participants to actively manage projects.

CASE STUDY ONE: DISCUSSION

This case involves scaling up in terms of administration, but the spatial size of the project remained small, unlike the next two case studies. Processes during project initiation clearly demonstrate the utility of both network and scalar analysis. Although the

²⁰³ Pers. comm., Spanish, 12/01/03.

project focused on one specific village, the core groups involved, such as the regional government and universities, PROFOR, and the World Bank, were networked across scales and jurisdictions. The project had hybrid social, economic, and ecological goals, as did the following two case studies. Although it was planned for national and regional actors to take a lesser role as villagers gained the capacity to manage the firm in the near future, a hierarchy of power often apparent through the breakdown of actors into material governance scales arose. First, there was disjuncture between administrative and financial administration at higher scales, while the majority of project activities were carried out at the regional and village levels. Second, there was clear dependence on international funding. Third, foreign technical specifications created difficulty for national and sub-national actors. Fourth, there was an increased forest sector role for the national government, in contrast to sub-national levels, with the creation of PROFOR, which did not have regional offices. Most state and donor negotiation continued to be carried out through the central government. Fifth, major economic and administrative decisions continued to be made from Managua in spite of the fact that the project was village-based and located in an autonomous region.

In spite of domination at higher scale, the ability of the regional government to shift scale both upward and downward in this case study shows increased consolidation of power. The regional government was able to both attract funding from higher scales and encourage the creation of a communal enterprise in Alamikangban. These scale shifts demonstrate advances in regional administration, and improved linkages to development networks, when compared to previous periods.

Historical patterns continue to impact regional self-governance. There is limited regional technical experience in forest management due to the fact that previous projects often relied on foreign consultants and national officials. Technical planning was particularly important in this case study because the reproduction of high quality species leading to genetic improvement and seed harvesting is an exact and complex undertaking. BICU consultants and regional officials may or may not develop the capacity necessary to meet project goals.

The location of a genetic reserve and seed bank in Alamikangban is appropriate due to high quality genetic stock in the area and the local need for employment. Nevertheless, there are local characteristics that challenge the project's initiation. Insecure land tenure restricted project location. Weak village institutions made it challenging to determine how to transfer equipment to a communal enterprise. Local tenure and institutions were perhaps not given sufficient attention during planning due to the formulative and technical structure of development planning in central state institutions and PROFOR donors, in particular the World Bank. These institutions are more accustomed to working with private rather than communal firms, where the decision making structure is clearer and broad representation is less of an issue.

Early stages of the genetic reserve project demonstrate inexperience with participatory approaches among national and regional institutions. Consultations with local populations were superficial and quick. Representation involved a token local organizer, but decision making power remained at higher scales. Activities in this case study were not broadly empowering, and they involved only a few village members

during fieldwork, in spite of the fact that project proposals were couched in the language of decentralization and increased local participation.

In my opinion, project administrators were naïve about the tenacity and frequency of local customs, such as savanna fire setting and nepotism in communal ventures, which I predict will limit the effectiveness of their programs. Previous state and NGO efforts to distribute materials and equipment to local villages in Prinzapolka have been plagued by corruption and misuse. At the end of fieldwork, I had little confidence that this project would be able to avoid similar problems, especially given the lack of effort made to profoundly involve local people in the project definition and structure. There was a dire need for investment in human resources in business administration if micro enterprises expect to succeed in Prinzapolka.

Administrators were trying to squeeze a long-term project into short-term donor funding cycles, and therefore allotted insufficient investment into social programs and broader ecological protection. In my opinion, savanna management, a complex and poorly understood activity around the globe and certainly within Nicaragua, needed greater attention in a project of this type. This coincides with insufficient attention to ecological characteristics in several of the following case studies in this work. Gene selection and seed sales were given the highest priority, due to their potential for generating profit, but this did not support a sufficiently holistic vision for community development during initial project stages.

In this case, the terms “local” and “community” appear to be used to legitimate particular political non-local interests or agendas, as Smith (1992, 1993) suggests can occur. This project originated from the regional level and was developed more at this and

higher levels than within village institutions. Although the project should bring local benefits in terms of employment and training, the exportation of certified pine seed is important to regional and national officials, as the conservation of genetic diversity is to global actors. It is essential for intermediary and national actors to prove that “community” forestry with indigenous populations is possible in Nicaragua in order to attract future funding for these activities. Groups at these non-local scales would receive a significant portion of these funds in their administrative oversight and support roles, in spite of the fact that projects are likely to target a village or group of villages.

CASE STUDY TWO: THE LIMI-NAWÂH CORPORATION

Like the previous case, this story can be broken into stages. Conceptualization describes the organization of Meadow Lake Tribal Council (MLTC) in Saskatchewan, Canada. The negotiation stage discusses MLTC’s two attempts in the late 1990s to create an indigenous corporation – first CESE, S.A. and then Makua International, in eastern Nicaragua. It also involves the indigenous NGO, Contigo International, created by MLTC in 1997 to assist indigenous populations in developing countries. Implementation refers to the forest partnership in the Prinzapolka and Bambana watersheds. The community corporation, Limi-Nawâh, was legally constituted in early 2003.

Conflict is common in community forestry; when projects start, tensions increase over resource sharing (Nayak 2003). Although the MLTC is considered a successful example of Canadian indigenous business ownership, implementation even in this industrialized country also involved conflict between the tribes and the firm they owned. This led to civil disobedience in 1992.

Conceptualization Stage

Meadow Lake Tribal Council (MLTC) was founded in 1978. It is made up of four Dene communities and five Cree tribes²⁰⁴ of Saskatchewan, Canada, who since the late 1980s, have carried out impressive development programs in conjunction with private companies and the Canadian government. MLTC became a model for First Nations because of its ability to generate and distribute wealth, as well as employ members of all skill levels in logging, mining, and service sectors. Plans involve social development, but “economic development is the engine of what MLTC has achieved” (Contigo International 2002: 34). MLTC’s success can be traced to a process of “scaling up.”

While the membership communities that form the MLTC maintain their independence, MLTC represents a pooling of resources in the areas of capacity building, community development, coordination, training and economic development on a scale which is beyond the reach of individual communities (Contigo International 2002: 29).

MLTC communities continue to have authority in a development model they define as bottom-up/top-down. These scale shifts were rooted in state policy. When the Canadian Indian Act passed into law in 1985, the central government wanted indigenous social programs to be addressed in blocs. When chiefs came together, there was a process of empowerment. They found that, similar to their own constituencies, other groups were not happy with the Indian Act. Indigenous groups started to organize politically, set up an electoral system, and create new tribal councils. In the decade of the 1980s, these councils evolved. Many, including MLTC, received money from the government to build their organizations and start businesses.

²⁰⁴ MLTC is composed of Clearwater River, Makwa Sahgaiehcan, Flying Dust, Island Lake, Canoe Lake, Birch Narrows, Waterhen Lake, Buffalo River, and English River First Nations.

In 1988, the chiefs of MLTC negotiated the purchase of fifty percent of Meadow Lake Sawmill from the Saskatchewan Provincial Government (Anderson 1997, 2002). This sawmill had been losing money for a number of years. TechFor Services, Ltd. purchased the remaining fifty percent and the company was renamed Norsack Forest Products, Ltd. The company's most valuable asset was the Forest Management License Agreement (FMLA) that it held from the Province of Saskatchewan. This agreement granted harvest rights on 3.3 million hectares of Crown Land in the Meadow Lake District. The FMLA required that licensed area residents be given employment priority and that a co-management process be established so that communities were involved in harvest, reforestation, and road construction decisions.

These forest rights set the stage for MLTC to form business alliances. A key partnership was between Norsack and Millar Western, Ltd., a privately owned Alberta corporation. The companies established a joint venture called Mistik Management, Ltd., with each holding fifty percent interest. Shortly after, MLTC formed MLTC Logging and Reforestation, Ltd., which contracted to cut and haul logs, build roads, and reforest.

Benefits began to fan out across the region to indigenous and non-indigenous residents. Individual tribes within MLTC formed their own forestry operations, as well as non-forestry companies, to service the growing local economy. Metis, as people of mixed indigenous and non-indigenous heredity are called, ²⁰⁵ worked with the local municipal government to create Norwest Logging and Reforestation, Ltd.

²⁰⁵ Metis originally referred to a mix between Indians and the French, but the term has been expanded to include any mix between indigenous and European descent. MLTC populations are considered to be pure or treaty Indians.

In three years in the early 1990s, Norsack and MLTC Logging and Reforestation paid nearly eleven million dollars in corporate taxes and withheld income taxes on wages, which proved an excellent return from the initial US\$1.3 million grant that Norsack obtained from the Canadian Government (Anderson 1997). These results justified financial support from the federal and provincial governments in First Nations businesses as there was benefit to all Canadians as a result of subsequent tax payment.

In spite of the financial successes, there was growing unrest in Meadow Lakes First Nations over the logging companies (Anderson 1997, 2002). First, clear-cutting and mechanical harvesting were having negative consequences on the local ecology and on traditional practices, such as trapping, hunting, fishing, and harvesting wild rice. Second, local populations felt that they did not have sufficient decision making power and were not receiving their share of the economic benefit from the forestry operations. In 1992, elders of Canoe Lake First Nation led a blockage on Highway 903. They started a group called “Protectors of Mother Earth.” There was a standoff with police and dozens were arrested and sent to jail. The blockade lasted for more than one year and halted MLTC Logging and Reforestation, Ltd. extraction in the area.

Since Norsack did not have access to the forests to extract, they were forced to negotiate with the protesters. A tentative agreement was reached on October 12, 1993.²⁰⁶ In the end, the blockage sped up the process leading towards increased indigenous management. First Nations, government, and industry co-management boards were

²⁰⁶ There was considerable discord before this settlement was reached. The provincial government took legal actions against the protesters in late 1992 (Anderson 1997). Protesters filed a countersuit with the Saskatchewan Human Rights Commission.

introduced. Tribal council representatives now had a voice in decisions, such as logging methods, location of roads, and the accommodation of traditional land uses.

Over the next years, MLTC increasingly earned respect. They continued to invest in forestry because their population lives primarily in the forest. They aimed toward ecosystem management over a large region. According to an MLTC consultant, Mike Stanley, it was a sort of revolution: First Nation forest management. They created a formula for the distribution of benefits, encouragement of private enterprise, creation of employment, and hiring of contractors. Resources flowed back to indigenous households; families provided other services, such as trucking. While the majority of sawmill workers were not indigenous, money and decisions remained in indigenous hands.

Meadow Lake tribes became full owners of Norsask in 1998; they bought out the company, as well as employees who had previously owned shares. MLTC needed sixty million dollars for this purchase. They were backed by banks because they had proven to be credible. They nearly paid off the loan within five years, but had to halt the payment of corporate dividends to communities until loan payments were complete. While members agreed to this decision, it was not a popular policy during implementation.

This history demonstrates a dramatic shift in ten years. In the early 1990s, MLTC was comprised of disillusioned populations forced to use violent means to express their dissatisfaction; today, the same population owns and manages million dollar enterprises. MLTC has a standing agreement with the pulp mill – tribal representatives have substantial impact because they sit on the board and play a role in hiring the president. MLTC established a solid reputation in international lumber markets. Leaders

consistently made strong investment decisions. Recently, they purchased interest in a regional airline, mining, and beef processing and packaging.

These accomplishments resulted from insightful planning. In the early 1990s, MLTC began to look holistically at their progress. In 1993, MLTC wrote a twenty-year development strategy. As they initiated a study leading up to this development plan, it became apparent that everything was needed. Their population had lower incomes, greater poverty, worse health, greater drug and alcohol abuse, higher welfare use, and poorer education and human resources than the general Saskatchewan population. MLTC created a process of active consultation with their membership to decide where to start. Members wanted to reach economic parity with non-indigenous Canadians, meaning that the same percentage would be employed with equivalent income.

MLTC's subsequent success resulted from the integration of social development with economic development. MLTC wanted to achieve parity in education, too. MLTC took over social programming from the government. Health, education, and welfare services became managed and distributed by First Nations. Chiefs decided where to invest logging profits in terms of social programs.

MLTC's innovation demonstrates the importance of leadership. The current head, Benjamin Richards, has been re-elected five times. Prior to this appointment, Richards was chief of his Cree community; he was first elected when he was only twenty-nine. Since 1980, he has been slowly convincing his own people to take charge of their own development. They were not initially convinced to attempt to take on medical and social programs because, as he says, "they didn't know what it meant."²⁰⁷

²⁰⁷ Pers. comm., English, 08/20/03.

Richards states that development of the MLTC has been a “long process of trial and error. We made mistakes in the beginning, and some things have failed.”²⁰⁸ He believes that trust is the most important element. Team-building is also important; much of his administrative team has been with him for more than twenty years. Richards notes that he has often had problems selling decisions to his people; yet, “when people finally take a hold of the idea, even the leaders have to hang on for the ride.”

MLTC began to think about working in other places. Leaders realized they could not duplicate their exact model in other countries, but they could encourage bottom-up planning, local empowerment, and good technical decisions. In the case of Canada, Mike Stanley claims, development programs were not working until control was placed in the hands of the indigenous people.²⁰⁹ Then, there were vast improvements. The advances under MLTC programs were significant, and they were directly related to political and institutional scale shifts and the ability to meet economies of scale for investments, lumber production, and other enterprises.

Negotiation Stage

MLTC established a working relationship with local indigenous partners in the RAAN and began to investigate Nicaraguan commercial forestry opportunities. A corporation called CEDE, S.A. was the group’s first attempt to expand its business into Central America. In April of 1995, MLTC leaders visited the RAAN. In June, RAAN indigenous leaders visited Canada. Negotiations continued over the next year. The

²⁰⁸ Pers. comm., English, 08/21/03.

²⁰⁹ Pers. comm., English, 03/23/03.

Canadians were to formalize a program with the Nicaraguan central government when presidential elections occurred in November of 1996. Implementation stalled.

MLTC created an NGO called Contigo International in 1997 to work with other indigenous populations and continued to study Nicaraguan forest development.²¹⁰ Makua International, a corporation that planned to run a forestry concession and sawmill in Prinzapolka, was created in 1998. Returning to negotiate with the central government, Makua International had support from the Canadian government and formal project approval from the RAAN government.

Makua's proposed management area was located to the north and south of the Prinzapolka River. This area was chosen because of the large expanse of mature, high quality pine and because of the low population density (Makua Internacional n.d.).²¹¹ Makua was interested in working in coniferous forests because of its experience with pine, including its markets and sub-products.

The Canadians and Nicaraguans involved in promoting Makua saw it as an alternative development model. The three principal components were sustainability, economic efficiency and profit, and social and cultural sensitivity. Makua identified several important goals, including the annual investment of six to eight million dollars, creation of two hundred direct jobs, the implementation of social programs, and fifteen million dollars of investment in infrastructure.

²¹⁰ Important sources included helicopter flyovers, Landsat images, and a state forest inventory.

²¹¹ Makua International identified commercial potential in 82,000 hectares of pine forest and in an additional 500,000 hectares of open savanna mixed with pine, mangroves, and broadleaf forests. Nearly all the pine was in late stages of development: only one percent was classified as young forest.

In the end, Makua was never implemented. The largest impasse came from conflicts with the Alemán presidential administration. Nicaragua's central government wanted to restrict local management of financial resources and have investment and profit funneled through national institutions. The Canadians found this proposal unacceptable since their goal was to work with indigenous populations and assist in human resource development and entrepreneurial ventures within native villages.

In 2002, with the entrance of the new Bolaños administration, Nicaraguan officials contacted Canadian representatives. According to Mike Stanley, who worked as MLTC's forestry and environmental consultant in Nicaragua from 1996-2000, the new government had been in power for seven months and was not able to implement development programs in the Autonomous Region, but they saw fishing and forestry as the best options. Stanley believes that the Nicaraguan central government was looking to partner with the Canadians "to prove that they are going to help the [Atlantic] Coast."²¹²

Implementation Stage

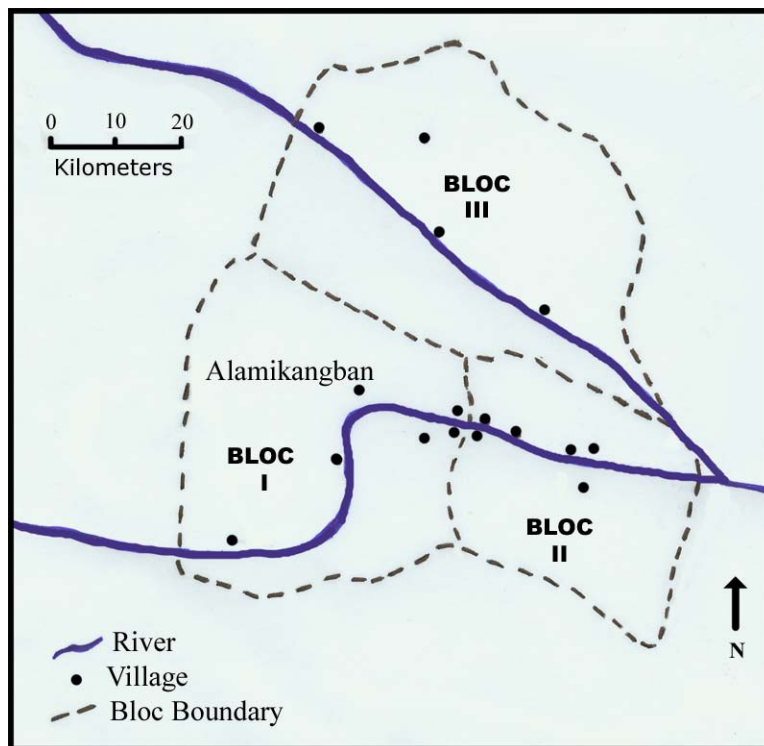
Limi-Nawâh was legally instituted in July of 2003 as the first indigenous corporation in Nicaragua. This project creation demonstrates a scale shift. It fused sixteen previously individual Miskitu and Sumu-Mayangna villages in three territorial blocs. In an attempt to meet an economy of scale for forest management and lumber exportation, the project targets approximately 700,000 hectares of untitled communal lands (see Map 4). Limi-Nawâh includes an estimated seven thousand people. Bloc One includes six villages: Tungla, Tasbapauni, Alamikangban, Klarindan, Lagrikula, and Buena Vista. Bloc Two also had six villages: Limbaikan, Galilea, Dos Amigos, Betel, Tuburus, and

²¹² Pers. comm., English, 07/23/02.

Auka/Mango. Bloc Three has four communities: Prinsubila, Isnawas, Wasakin, and Layasiksa. In 2004, Limi-Nawâh had added Kuamwatla and Prinzapolka Bar, located at the mouth of the Prinzapolka River, to provide the organization with additional forests and a means of access to the sea. This is an example of institutional flux involving shifting scales in a process of horizontal networking.

MAP 4

Limi-Nawâh, 2003



The dominant ecosystem was open pine savanna; there were smaller extensions of both wetlands and broadleaf forest. Along with a series of lakes, tributaries, and streams, the three blocs also included large sections of two major rivers – the Prinzapolka and the Bambana. The entire watersheds were not included. The heads of the Prinzapolka and Bambana Rivers were located in areas with large mestizo populations, and MLTC was

interested in involving indigenous partners. MLTC also targeted zones with existing forest resources and, northeast of the Prinzapolka and Bambana Rivers, tends to be deforested in comparison with the area selected.

The Limi-Nawâh website (2004) touted the “evolution of a political giant: the Prinzapolka-Bambana Territorial Council, which they called a ‘Canadian-style’ indigenous tribal council.” Contigo International was contracted as Limi-Nawâh’s project administrator, technical service agent, and finance director for five years. In this role, Contigo maintains an office in Managua. Limi-Nawâh’s office was in Alamikangban during fieldwork.

The role of certain key individuals was decisive to project initiation. MLTC leaders recall a phone call from a Miskitu Canadian immigrant named David Maldonado suggesting that they work in Nicaragua.²¹³ MLTC had to convince their constituency and then promote a partnership with the Canadian government through the Canadian International Development Agency (CIDA). MLTC Chief Richards and his administrative team were instrumental to the Tribal Council’s insertion into Nicaragua. Another core individual, Mike Stanley, first consulted for MLTC in Canada and then throughout initial attempts in the late 1990s in Nicaragua. Stanley was contacted by MLTC to become re-involved. In 2002, Stanley moved to Managua to spearhead the project along with Maldonado, a major actor in Contigo. The Canadians began selling the project within Nicaragua. In 2003, Stanley stated, “The hardest part is keeping a high

²¹³ David Maldonado was originally from the municipality of Waspam, RAAN. After being jailed and tortured as a result of civil conflict during the Sandinista administration, Maldonado immigrated to Canada. Maldonado has also been involved in the creation of international development projects to assist the RAAN, most notably the NGO *Pana Pana*.

level of interest because we have already been here for years – since the mid-1990s – making promises.”²¹⁴ Another major challenge at the initiation was the need for increased donor support; in this aspect, representatives in the Canadian Embassy and the CIDA office in Managua were highly supportive. Another key individual was American Dan Edington, the project’s field officer in Alamikangban.²¹⁵ Edington moved to Nicaragua in 2003 and at the time of fieldwork, had the difficult job of balancing local and global demands – part of his job was to justify local expenses to international donors.

During the initial insertion stage, MLTC attempted to work with elders to establish election by-laws for choosing village representatives. Leadership by elders is typical in RAAN indigenous communities,²¹⁶ but at the same time, MLTC recognized that the elders’ role had been substantially eroded. Working with elders proved to be difficult in some villages, such as Alamikangban, due to this erosion. A member of Alamikangban’s elder council recalls that he was invited to the first meeting Contigo held in Alamikangban to discuss the elections, but that he and the other elders did not participate in the process after this meeting. The two community leaders chosen to organize the elections in Alamikangban in the name of the elders were both in their forties. Elder administration worked better in some villages, but this is an example of how donors may propose a model, and publicly advertise this process, but local populations implement proceedings in their own manner.

²¹⁴ Pers. comm., English, 03/25/03.

²¹⁵ In the 1970s Edington worked in the Peace Corp in Nicaragua and assisted the National Promotion Institute (INFONAC) with RAAN lumber projects. At the end of his term he stay in Prinzapolka and worked with the wood company Celnic. He left in 1978. Edington contacted Contigo when he heard about the project. In 2002, the Limi-Nawâh Board unanimously voted him their on-site project manager

²¹⁶ Where the Canadian model diverged from the RAAN model was in the participation of women. They mandated that one elder man and one elder woman head the organization of the election in each village. In the RAAN, only men serve on the elder council.

During March of 2003, elections were held for the project president, sixteen village directors, and five commission members per village.²¹⁷ In total, the elections had cost approximately \$30,000 and they were supervised by the national Supreme Electoral Council.²¹⁸ The elections received the highest participation of any held in Nicaragua – as much as eighty to ninety percent of the adult population voted in most communities. Even in villages with lower participation, such as Alamikangban, approximately half of the eligible population voted. This is clearly a demonstration of local agency. The election of the board would also be very important to the expression of local power. Prior to elections, it was donors and NGOs that made decisions such as the villages to be incorporated. After Limi-Nawâh board was created, it would be the village representatives who would vote for or against the incorporation or release of groups.

Villagers originally nominated candidates in a public forum. There were three potential project presidents, two village director candidates, and up to ten commission members per ballot. One important stipulation was that candidates were either born in the area or were at least considered long-time residents. Weeks prior to the election, each presidential candidate spoke at a public forum in each village, but the speeches appeared to have little impact on vote casting because people predominately voted for the candidate from their geographical bloc. Voting also broke down along ethnic lines as the

²¹⁷ The standing commissions include land demarcation, education and social services, sports, and culture.

²¹⁸ State election officials expressed that they had a highly valuable experience traveling to member villages administering and certifying the elections. I had the opportunity to boat the rivers and camp in the communities with them over a week period as they processed the experience. I saw the respectfulness, flexibility, and openness of central government officials as they worked among the Miskitu. I was impressed and surprised by the attitude of these and the few other national-level officials whom I meet in Alamikangban.

Miskitu inhabit the first two blocks, while Sumu-Mayangna populations are greater in the third.

Within member villages, there was underlying conflict among the two ethnic groups. One Sumu-Mayangna leader commented that Limi-Nawâh was a continuation of the regional history because it maintained Miskitu oppression of the Sumu-Mayangna. He noted that with fifteen Miskitu communities and only one Sumu-Mayangna village, a Sumu-Mayangna never had a chance to win the Limi-Nawâh presidency. Partially in response to this concern, the Sumu-Mayangna candidate for president became the vice-president of Limi-Nawâh, even though this candidate came in third after votes were counted.

In addition to internal controversy, there was some criticism by municipal and regional officials. Regional officials initially called the elections illegal and dangerous. This may have been the result of their feeling threatened by an NGO assuming a governmental function. With the candidate slander and name-calling evident in Alamikangban, the elections took on some of the political nature of state elections. In one village, a municipal official tried to unduly influence the selection of one candidate above another. Further, a central government representative, the judge overseeing the municipality, initially ran for the Limi-Nawâh presidency, but he later withdrew when a conflict of interest was pointed out.

The elections were professionally administered and the ballot casting was transparent.²¹⁹ In Nicaraguan villages, the high participation created some optimism. For the Canadians, the high rates of turn out in the elections made it evident that the

²¹⁹ I witnessed ballot casting in four villages as well as vote counting in Alamikangban.

Nicaraguans trusted them and had accepted working together. Now, Stanley noted, “The project has to deliver.”²²⁰

After the elections, Limi-Nawâh hit the ground running. With the institutional structure in place, the administrative team announced a set of immediate goals, such as the approval of the constitution and by-laws as prerequisites for recognition in the National Assembly. They also needed to construct a building complex, which included offices, meeting rooms, dormitories, and kitchen facilities. They planned inauguration festivities and publicity. They also needed to define initial projects and secure funding.

Limi-Nawâh’s goal was sustainable forest management and extraction; this included training local populations to become business owners. At the time of my fieldwork, Limi-Nawâh had defined several initial projects to diversify and strengthen the local economy – improvements in crop production, cattle ranching, and ecotourism, including sport fishing.²²¹ A 2003 project proposal deemed that after subtracting expenses, sixty-five percent of the total gain should be applied towards an economic development fund, which would cover the reduction of debt, investment, corporate management, plans, and demarcation. The other thirty-five percent would be used for social development. These assets would be distributed to communities to define and finance their own projects.

Limi-Nawâh’s inauguration was held in Alamikangban on August 21, 2003. Up to twenty representatives from each of the sixteen villages arrived by boat or truck,

²²⁰ Pers. comm., English, 03/25/03.

²²¹ Other projects include harvesting precious hardwoods, agricultural credit, packaged meat and beef jerky, silviculture, industrial rice and pineapple production, pine seed extraction, forest protection, reforestation, and land demarcation. Future businesses ventures may also include pressure treating lumber for pre-fabricating houses, medicinal plants, carbon sequestration, and industrial bamboo.

including three baseball teams combining players from each block. Cultural activities such as dancing, canoe racing, archery, and traditional food preparation were carried out.

The Alamikangban airplane runway was used for the first time in years as a MLTC delegation, journalists, and state officials flew in. One of the highlights of the inauguration was a dance presentation by the MLTC delegation. A Cree Indian danced several traditional dances in full regalia. A photograph can be found in Appendix Five. The dancer expressed his feeling of honor at the opportunity to share his culture in Prinzapolka. He had never been further south than Montana.

MLTC's business manager noted that the Canadians were "humbled" by the value of natural and cultural resources that Prinzapolka populations possessed and what they were "bringing to table."²²² Acknowledging that they did not have experience in Central America, he proposed that the appropriate local institutions would evolve as part of a learning process. He believed that some lessons from Canada remained valid in this new circumstance. Changes could not be made quickly and the creation of structures for long-term governance would be important.

In spite of initial Limi-Nawâh accomplishments, the corporation faced resistance in some sectors. As one community leader noted, "The municipal councilors just want money. They do not care about the people. If projects are not going to pay them, they are going to come out against them."²²³ On August 24, 2003 a scandalous newspaper article based on unsubstantiated remarks from a few municipal representatives and village leaders was published in the national press. The article stimulated pre-existing concerns

²²² Pers. comm., English, 08/20/03.

²²³ Pers. comm., Spanish, 08/27/03.

critics held about international programs. For example, it stated that the Canadian partners were trying to claim indigenous land as their own and had plied villagers with alcohol to get their support. I could judge the invalidity of the charges because I attended the inaugural events where the supposed interactions occurred. The individuals who made the claims in the national news were absent from the events they described.

Limi-Nawâh struggled to achieve acceptable balances between customary and new leaders. Contigo encouraged the participation of women leaders in the council. Contigo also insisted on hiring women in order to meet the gender equity requirements of international donors, which met with resistance from some village men.

New Limi-Nawâh directors were impatient to change customary leadership structures. Limi-Nawâh promoted council governance as a more valid structure of community representation than the *sindikos*. They believed that councils could increase accountability and democratic representation. Many saw the council as an opportunity to transform and improve leadership. Some Contigo and Limi-Nawâh representatives were closed to the *sindiko* structure from the start,²²⁴ others were initially open to working with *sindikos* on land demarcation, fire brigades, or to establish hunting and fishing standards. However, the latter began to change their mind in 2003 when they observed *sindikos* commit illegal acts, such as selling communal land, forging signatures, resisting elections where they may be replaced, and breaking environmental legislation.

²²⁴ A Contigo representative commented that “Don Ambrocio is always mad about something. He’s a *sindiko*.” According to this individual, this type of posture is due to the fact that *sindikos* always “think that there is money and that they are not getting their part” (Pers. comm., Spanish, 08/20/03). In December of 2004, I was informed by a project administrator through electronic mail that they were partnering more effectively with local *sindikos*. I have not substantiated this claim.

Two competing power structures existed in 2003 (author's fieldnotes). Village members who defend the institutions of *sindiko*, *wihta*, and elder council felt that Limi-Nawâh violated local practices by encouraging the election of new leaders instead of merely working through standing officials. This position was largely held by those whose power was challenged by Limi-Nawâh's multi-village council. Their criticism was supported by RAAN populations who were working to strengthen the political role of traditional leaders and who saw this new structure as a threat to recent advances in the acceptance of *sindikos* as the base structure of formal natural resource governance.

A concurrent NGO and international donor partnership with a project in Alamikangban and proximate villages focused on strengthening traditional leadership in 2003.²²⁵ A village leader commented about this project and Limi-Nawâh that, "Each one wants to exclude other. Each is not open to the other because they want to be the only one with power."²²⁶

A major goal of Limi-Nawâh was to change a negative leadership history and teach people to function in a council (author's fieldnotes). People did not know how to administer funds due to both corruption and poor planning. Many village directors were young. They were elected due to the requirement that candidates be able to read and write; many older villagers and traditional leaders could not. However, in initial months, young directors seemed uncomfortable with their new power. They were timid about defending Limi-Nawâh's decisions to the community and about representing their

²²⁵ Although a transnational development initiative, this project did not focus on forest issues. I observed project initiation, but this case was not included in my study.

²²⁶ Pers. comm., Spanish, 08/26/03.

village's needs within the corporation. One village leader describing early activities stated:

Limi-Nawâh's problems come because they want to give control to the communities and they don't deserve it. They are not ready yet. Most people are only looking for money and what they can get out of the project. Things are moving too quickly. Projects need to start slow and hand over power little by little – not all at once.²²⁷

Since Limi-Nawâh job opportunities and social programs are likely to attract new people to the area, communities may face additional conflict as rights and privileges are determined. In many indigenous villages, certain families are hegemonic. One of the strongest case examples existed in Auka Mango with the Flores family, who made up approximately a quarter of the village population (author's fieldnotes). Seven candidates out of the ten for the Limi-Nawâh commission were Flores family members and four were brothers and sisters. The elected village director was married to a Flores. This could create problems in the perception of equitable distribution of resources among community members.

Contigo estimated the levels of unemployment prior to the commencement of the lumber firm to be eighty-five percent. Limi-Nawâh proposed to create 1,500 jobs in the first decade and double this number over twenty years. Within ten years, they would reach national employment levels and, within twenty years, they would meet the needs of growing and incoming populations. Local people want jobs immediately. Since the pine management will take longer to initiate, communities pressured for hardwood extraction. The Canadians were not initially going to harvest precious species because this was not their area of expertise, and it could open up criticism from conservation groups.

²²⁷ Pers. comm., Spanish, 08/25/03.

Limi-Nawâh was predominately a global-local partnership, but there are numerous other scales vying for power, which is a factor that can be overlooked in the analysis of “glocalization.” Sub-national institutions were not immediately brought on-board, and some intermediary officials appeared threatened by Limi-Nawâh and spoke out against the project. National government agencies provided inconsistent support for the project. Meanwhile, endless Nicaraguan bureaucracy and administrative ineptness caused major project delays in importing materials and establishing the initial forest management plans. Although local populations approved pine extraction for the construction of an office, state agencies stalled the forest management plan because they could not define where the Alamikangban forest reserve, created in 1991, was exactly located. If office building or timber harvesting would impact the protected area, permission was necessary from the environmental ministry MARENA. If they were outside the reserve, only INAFOR could review the proposal.

Stanley believed that small-scale forestry only allows one to “manage for the trees and not for the people”²²⁸ and that Limi-Nawâh was a new spatial model for community forestry. It was at a larger scale than just one village due to the work in blocs and the multi-village council structure. For Stanley, these larger structures were important to defend indigenous rights so that they are not swallowed up by corporate interests.²²⁹ For Limi-Nawâh, working at larger scales was also important to attract large international investment and meet an economy of scale for processing and marketing. It also would assist with creating a diversified economy because there were different assets within

²²⁸ Pers. comm., English, 07/23/02.

²²⁹ Pers. comm., English, 11/24/03.

member villages. A single Nicaraguan community, he believed, did not have the resources to effectively manage their forest or to fight forest fires. The only manner to avoid a tragedy of the commons was “scaling up.”

Limi-Nawâh was planning a detailed forest inventory of the entire area. There were several standing forest concessions within the area and it was necessary to determine which state logging permits were valid. Limi-Nawâh was trying to orchestrate a balance between immediate income and future investment and between social and economic programs. The organization was preparing a twenty-year development strategy in consultation with member communities. Development planning requires time; meanwhile, people were impatient for visible results.

In April of 2004, Limi-Nawâh began commercial lumber extraction in 4,500 hectares of forests with a small sawmill near Alamikangban. Limi-Nawâh planned to process 3,000 cubic meters of roundwood – the majority would be andiroba. Half of the production would be sold to the national market and the other portion would be exported by barge through the RAAS.

Investment over the first five years was expected to total approximately fifteen million dollars. CIDA had committed funding during the initial time block. Other investors were now being invited to fund project modules and CIDA would facilitate communication between partners instead of being the main donor.

CASE STUDY TWO: DISCUSSION

MLTC is one of the best international examples of indigenous tribes scaling up to increase benefit among participating groups. I am less convinced, however, that Limi-Nawâh villages will have the same remarkable success in spite of the fact that they have

shifted scales in a similar fashion. Time will tell if the member villages can overcome the technical, institutional, infrastructural, political, and financial constraints found in eastern Nicaragua.

This case demonstrates that activities in developing countries can boomerang to influence donors' activities in international spheres. In 2003, MLTC leaders admitted their concern over the polarized and often chaotic political landscape in Nicaragua. MLTC had earned a solid business reputation. Investors trusted them. If they encouraged contractors to buy from the RAAN and were not able to reliably deliver a high quality product, they could lose what they had worked to build. Case study two suggests that it is difficult to take a model that has been employed in the context of developed countries and apply it in a remote region of a peripheral country.

Although localization and globalization occurred in each of the cases under analysis, case study two had the most extreme shifts during fieldwork. Nevertheless, there were still some constraints to the complete devolution of administrative power. International development investments are often indirect in that a portion of funding goes to intermediary offices in urban settings and to consultant salaries and fees. This process occurred in Limi-Nawâh's initial period as the main "movers and shakers" lived in Managua. In spite of periodic voting in elections and council meetings, it was too early to determine if day-to-day administrative decision making, and especially the control of finances, could or would be decentralized to village representatives. This reinforces the need for nuanced scalar analysis of project activities.

Limi-Nawâh has brought rapid change to participating villages. Canadian donors, consultants, and support agencies gave more attention to the development of local

institutions and issues of indigenous empowerment than the other cases in my research. However, communal leaders were initially threatened by the project, as were municipal and regional institutions. I suggest in Chapter One that the articulation of activities at various scales may be important to the success of projects. This hypothesis could be tested with Limi-Nawâh in the future. During fieldwork, there were examples of intermediary scales attempting to create problems for the project, such as with the slanderous newspaper article, but it was too soon to determine the impact of such activities, which over time could either be forgotten or implode.

Community forestry enterprises require a huge investment in human development due to the historical and present situation in Prinzapolka. Like other commerce-based models, the idea behind Limi-Nawâh is that proceeds from extraction can pay for human development (e.g., social programs, job training). It is too early to determine if this will occur in the future. The project was yet not earning money during my fieldwork and had not sold large quantities of lumber as of mid-2005, but the office and sawmill construction were just being completed. This will be an interesting case to continue to follow in the future. Will the “commodity dreams” become a reality? If so, in a developing country, can indigenous self-determination and environmental protection co-exist with large-scale exportation of forest products?

CASE STUDY THREE: THE ATLANTIC BIOLOGICAL CORRIDOR

Like the previous cases, Nicaragua’s Atlantic Biological Corridor (ABC) initiation can be broken down into three phases. Conceptualization involved the creation of the Mesoamerican Biological Corridor (MBC) and individual Nicaraguan protected areas. The impetus for the ABC, in conjunction with other Central American countries,

was different than the other two cases. ABC negotiation moved into the national arena in the mid-1990s. Unlike the other two cases, the implementation phase consisted of two distinct periods. Early implementation covered the initiation of the project from October 1998 to December 2002, during which the project was highly centralized – there was little presence in the RAAN and virtually none in Prinzapolka. Late implementation covered January 2003 to October 2004, when ABC funding ends. During this stage, the majority of the project personnel changed, there was significant decentralization, and consultants had a presence in Prinzapolka villages. My account deals with this phase up through the month of December of 2003.

Conceptualization Stage

The MBC, covering 768,000 square kilometers, has been called the largest conservation project in the world (Laguna Benavidez 2000). Such a massive project took years to become reality. Starting in the 1980s, Dr Archie Carr III of the Caribbean Conservation Corporation and associates at the Wildlife Conservation Society first envisioned a natural corridor across the range of the Florida panther in North, Central, and South America. The project became known as the path of the panther, or “*Paseo Pantera*.” It was not until the 1990s, and the resolution of civil conflicts in several Central American nations, that a corridor project began to develop across the isthmus.

Although there were a few protected areas in Central America prior to the 1960s, in the decades of the 1970s and 1980s there was a burst of new protected areas (Barborak 1992). Regional cooperation on biodiversity and environmental issues also increased. The establishment of the Central American Commission on Environment and Development (CCAD) in 1989 was an important stepping stone. In 1994, at the Central American

Ecological Summit, the Central American Alliance for Sustainable Development (ALIDES) was formulated. Member governments committed to a series of environmental measures, including the creation of a system of corridors (Miller et al. 2001).

The Paseo Pantera project was proposed to link protected areas using corridors of natural and restored habitats (Miller et al. 2001). With the inclusion of Mexico in 1997, the project became known as the Mesoamerican Biological Corridor (MBC). The MBC was broader in scope than the Paseo Pantera, as the aim was to integrate sustainable development and ecological protection. Goals were to protect key biodiversity, connect protected areas with corridors that allow the movement and dispersal of plants and animals, and promote equitable and culturally-sensitive social and economic development around these zones and corridors (Miller et al. 2001).

While the Paseo Pantera was criticized because of its biological focus and inattention to social development, the MBC tried to correct this oversight. Yet, the risk remained that the project would be perceived as an intrusion on indigenous lands in spite of the fact that the project had a wide range of goals, including the promotion of indigenous development, grassroots participation, and decentralized governance. The MBC had four land use designations: core protected areas linked by corridors and surrounded by buffer and multiple-use zones, which are expected to host biodiversity-friendly land use practices, such as agriculture, fishing, and ecotourism. The relative area of each MBC zone depended on social, economic, biological, and institutional context.

The MBC was a project of unprecedented scale. Large amounts of donor funding and international cooperation were required. More than sixteen million dollars were granted from GEF, UNDP, and the German Technical Cooperation Agency (GTZ).

Numerous other major donors and technical consultants were also involved. Support came from USAID. Nongovernmental conservation groups involved with the project included WWF, IUCN, Tropical Agricultural Research and Higher Education Center, Wildlife Conservation Society, World Resources Institute, Nature Conservancy, Conservation International, and others. In each of the eight countries in the MBC, there were additional organizations involved. In spite of support, there has been international concern that the MBC has potentially unrealistic goals due to the huge size and wide scope of the project (Miller et al. 2001).

Negotiation Phase

Nicaragua's section of the MBC, the ABC, covers most of the Autonomous Region. There are seven high priority conservation areas within the ABC (GEF 1997). There were nearly 140,000 people living within these priority areas in the mid-1990s when the ABC was planned, with over 90,000 indigenous people. The location and size of the corridors between these interconnectivity zones were not intended to be expressed as lines on a map (GEF 1997). While Map 2 gives an idea of the general location, I have not mapped hypothetical corridors since the project was materially non-existent in the municipality at the time of research.

The ABC planned for conservation corridors to connect the nuclei and increase the habitat and movement of important species. It was proposed that corridors would benefit everyone in the zone because of the shared use of air and water, as well as the

increased mobility of genetic resources. With a large-scale vision, representatives did not want the ABC to be classified as “just one more project.”²³⁰

ABC funding came from GEF, the Nordic Development Fund, and the Nicaraguan central and regional governments, who contributed ten percent of the total project funds. Technical support was provided by the Central American Regional Environmental Project (Proarca), UNDP, and Carl Bro International. The ABC’s national counterpart agency was the environmental ministry MARENA.

In the early 1990s, Nicaragua was slow to implement international conservation legislation. Nicaragua’s first eligibility criterion for the ABC was met in November of 1995 with the ratification of the Convention on Biological Diversity. Nicaragua was the last country in Central America to sign the convention. Belize signed in 1993; Costa Rica and El Salvador signed in 1994; Panama, Guatemala, and Honduras signed earlier in 1995. Nicaragua was also behind the rest of Central America with the creation of protected areas. State institutions, especially conservation agencies, were poorly developed, civil society had low capacity, and the nascent decentralization process was frequently conflictive. According to the ABC proposal, a project in Nicaragua aimed merely at the long-term integrity and use of natural resources within a biological corridor would not be sustainable; additional socio-economic components were necessary. The report cited that: approximately half of the protected areas included in the proposed ABC did not receive any kind of support; there were no incentives for biodiversity conservation or sustainable resource use outside of officially designated protected areas;

²³⁰ Radio Caribe interview with Marvin Moncada, the ABC National Technical Advisor, and Mel Waters, the RAAN Coordinator of the ABC. Bilwi, Spanish, 02/07/03.

there was a lack of political consensus at sub-national levels on the importance of biodiversity; a land use and natural resource conservation strategy did not exist and, therefore, programs could not be designed and implemented to match any coherent plan; and a monitoring and evaluation system for natural resources and biodiversity was missing.

Early Implementation Phase

Nicaragua was initially expected to be an early example of MBC implementation. Nicaragua was the first country to sign up for the regional initiative. The original starting date in the GEF proposal was May of 1997, but the project did not start until late 1998. When Hurricane Mitch struck in the end of October of 1998, there was additional delay.

The limited ABC presence in the RAAN created substantial criticism. While the initial ABC proposal stated that the regional government would work in conjunction with MARENA to direct ABC activities, local governance was bypassed and decisions were handed down from the central government. Representatives in Managua spoke in the name of the communities without consulting with the people of the region. In 2000, a Miskitu activist in Bilwi stated:

It is shame that such a big project exists only in name and here at the base, there has been no presence. If there has been any local involvement, it is only with one or two people. Corridor representatives come in for meetings and then leave.²³¹

He continued, “If the biological corridor reaches here, it is going to arrive too late. Here, it is no longer a matter of discussion and discourse, it is a time for immediate action.” In June of 2000, a RAAN environmental leader stated:

People thought that the indigenous communities would be able to participate within the ABC, protect their resources, and look for new production options. But,

²³¹ Pers. comm., Spanish, 06/19/00.

after a period, it became obvious that the project had become politicized...All the funds are going to be gone and the people of the corridor project will never have visited Sandy Bay, the area around the Miskito Cays, or Prinzapolka.²³²

He added:

I hope that the corridor comes...already the people have lost confidence. So, when the biological corridor finally gets installed in two, three, four more years, or whenever they come, there won't be any more lobsters, turtles, or jaguars. Then, I don't know, what corridor are we going to be talking about?²³³

During these years, RAAN leaders frequently complained well-paid personnel gained expensive offices in Managua with project funds. New trucks with the ABC logo were visible in the capital city. A regional leader stated, "Here there is no ABC truck or motorboat with the name painted on the side...The biological corridor is not here in [Bilwi], but in the corridor offices in Managua, they are all rich now."²³⁴ There was growing concern that the control over ABC finances and administration handed a self-interested state more power over a region struggling for the actualization of political autonomy. What local people had hoped would provide development alternatives appeared to have been co-opted by a state hoping to greenwash its image using funding from external donors without actually initiating conservation.

In spite of political constraints, there were several important advances toward the improved management of natural resources. Nicaraguans received technical training and the country updated its maps. For the first time, RAAN institutions were included in technical work on natural resource management in cooperation with national and international counterparts. In May of 2001, three institutions signed an accord with the

²³² Pers. comm., Spanish, 06/11/00.

²³³ Pers. comm., Spanish, 06/15/00.

²³⁴ Pers. comm., Spanish, 07/02/01.

ABC to form an environmental monitoring network.²³⁵ As this project evolved, their collection of scientific data scaled up to form part of the Regional System of Environmental Information and the National Environmental Information System and scaled down into a research network of village promoters.

There were benefits for the central and regional governments, such as an improved development strategy based on the results of the high quality research by international consultants. Studies done in conjunction with Carl Bro and the Nordic Development Fund were completed between May 2002 and October 2003. They covered marine resources, mining, forestry, transportation and infrastructure, decentralization and municipal development, tourism, and rural economies and productive systems.

In spite of advances, the ABC was clearly stalled by the Alemán administration. Two conditions took multiple years to meet – the approval of an indigenous land titling law and the creation of a National Environmental Fund (FNA), which is a separate government entity to administer ABC funds. According to an ABC administrator, the World Bank saw this as an important requirement in order to deposit funds for ABC and also as an instrument for national responsibility for obtaining and administering natural resource management finances. GEF was not to fund a second phase and, therefore, the FNA was intended to take over and follow up on what the ABC project initiated.²³⁶ A decree for the FNA was not approved until October 15, 2001 and the FNA was not

²³⁵ Namely the University of the Autonomous Region of the Caribbean Coast of Nicaragua (URACCAN), the Bluefields Indian Caribbean University (BICU) and the Foundation for Development Assistance on the Atlantic Coast of Nicaragua (FADCANIC).

²³⁶ Pers. comm., Spanish, 11/27/03.

actually working until 2003. This produced a serious delay so that project implementation was years behind schedule.

Late Implementation Phase

President Bolaños changed ABC personnel. With limited time, the new leaders had to readjust the project strategy to address the most pressing development issues and redefine new goals that would be completed before funding termination. Previous to 2003, there was only one ABC representative in Bilwi and all the others were in Managua, where the decisions were made. This switched so that all representatives were in the Autonomous Region except one, the Technical Advisor in Managua, who served as the point person for contact with international donors. Planning was transferred to the Autonomous Region, although it was still done in conjunction with international consultants. Administration of resources was decentralized, but still had to fit within the terms of reference of the World Bank.

The decentralization of the project brought several benefits. A predominately technical program became more people-oriented. The RAAN government worked more closely with local populations. This was the first attempt in Nicaragua at large-scale community-oriented planning; there had been national, regional, and municipal planning, but there was seldom widespread village consultation. The ABC gave copies of plans back to villages so that they could serve as a future planning instrument. Previously, such documents stayed in government offices.

The ABC completed fifty-three village development plans in the RAAN and thirty-seven in the RAAS. The number of proposed subprojects ranged between two and fifteen per village. Proposals for the ninety villages are categorized in Table 11. The

greatest number of proposed Nicaraguan subprojects focused on production, followed by infrastructure and social programs. Ironically, considering the subprojects were linked to the creation of biological corridors, the fewest number of proposals addressed ecological programs.

TABLE 11

Proposed Atlantic Biological Corridor Subprojects (CBA 2003)

Project Orientation and Type	Number	Percentage
Production —agriculture (75), forestry (53), livestock (49), agroforestry (34), fishing (22), agroforestry with livestock (20), sewing and crafts (14), processing (9), hunting (1)	277	38.9
Infrastructure —transportation (72), water (65), marketplace (40), housing (14), solid waste (9), electricity (7), urban (6)	213	29.9
Social programs —education (83), health (75), land titling (10), sports (5), culture (1), leadership and legal support (1)	175	24.6
Ecological programs —reforestation (27), environmental education (6), restoration (6), conservation (3), fire control (3), ecotourism (2)	47	6.6
TOTAL	712	100

Of the more than seven hundred Nicaraguan subprojects suggested, over sixty percent suggested a potential future collaboration with multi- or bilateral agencies, or the state institutions they funnel money through (CBA 2003). In eastern Nicaragua, the creation of transportation, utilities, and waste infrastructure generally utilizes

international assistance and the majority of schools and clinics are constructed with foreign funding. Of the 158 proposed projects targeting health care or education, construction was included in 122 proposals, which suggests that international financing would be necessary in many cases. The funding of the writing of proposals on the part of donors, like the World Bank and the Inter-American Development Bank, was likely to increase their own future regional project portfolios.

The ABC started to finance projects; by late 2003, there were thirteen projects in different RAAN communities.²³⁷ In 2004, ABC offices in Managua and Bilwi were planning to distribute information on villages whose community development plans did not receive funding. The ABC database was designed to assist other governmental and nongovernmental programs, such as mayor's offices, regional government, international donors, and NGOS, to enter into villages to implement projects more rapidly. One form of marketing the community development plans to potential donors was through the Internet.²³⁸

In late 2003, the primary ABC representative in Managua stated, "We are finishing, but really we have just started."²³⁹ While the ABC made vast improvements in final implementation stages, it wasted valuable time and financial resources during the initiation. The RAAN ABC coordinator stated in the end of 2003 that the project was able

²³⁷ Additional multilateral assistance transferred to ABC projects. US\$ 0.8 million assigned to the *Pro-socio-ambiental Forestal* (POSAF) project, which was also administered under MARENA and had World Bank funding, were assigned to ABC-generated community development projects in the Autonomous Region.

²³⁸ The site was not maintained and by 2005 the linkages could not be followed.

²³⁹ Pers. comm., Spanish, 11/27/03.

to achieve more in one year under a decentralized structure than it had been able to achieve since 1998.²⁴⁰

The ABC in Prinzapolka

In February of 2003, select Prinzapolka leaders were included in a diagnosis of problems and potential projects. When consultants arrived in Prinzapolka, the ABC had been working for a year in the other two RAAN municipalities of Waspam and Puerto Cabezas. Nine Prinzapolka communities were visited.²⁴¹ People were kept in the dark until the actual day of consultation. Although consultants came through Alamikangban and traveled down the Prinzapolka River before initiating meetings on the lower river, they did not give people advance warning. A small group attended the initial consultation and then a snowball method was used to speak to additional villagers about governance and production. Consultants interviewed people using SWOT analysis, meaning that they formulated a list of the strengths, weaknesses, opportunities, and threats. A regional technical committee later developed and wrote up potential projects based on the most viable suggestions from community members. The final written community development plans combined project proposals with relevant background information from participating villages.

During the initial consultation, an attempt was made to involve a spectrum of community leaders, such as pastors, teachers, elders, and women. The diversity of representation varied between villages as project representatives worked quickly during participatory consultations and relied on a few key sources to determine who should be

²⁴⁰ Pers. comm., Spanish, 11/05/03.

²⁴¹ Alamikangban, Buena Vista, Dos Amigos, Galilea, Klarindan, Ladrikula, Limbaikan, and Tuburus all border the Prinzapolka River. La Palmera is located on the entrance road to Alamikangban.

invited to meetings. During appraisals, consultants generally spent between one and three days in each village.

In Alamikangban, the first assembly included approximately twenty-five individuals. People were selected by one individual. I witnessed this when I discussed the process with him at the time. When this person made the verbal invitations, community members assumed there was a connection between the ABC and the particular NGO with which he worked. When his announcement went over the village loudspeaker inviting the participants, an uninvited community member begrudgingly commented to me, “It’s all politics.” The announcement only stated the names of the people who were invited to the workshop without mentioning any specific objective, so people did not know what they were invited to attend.

At the Alamikangban consultation, many participants were strongly in support of forest extraction. In spite of the fact that the consultant announced that the ABC wanted proposals for conservation and natural resource management, participants asked for a large company to come and extract resources, and they complained about state forestry laws that limited local extraction through restrictive permitting processes. However, some participants that had previously attended development workshops, or had a greater knowledge of conservation rhetoric, asked for projects that would fit better with ABC objectives. In February of 2003, one of the core RAAN consultants for the ABC admitted that he was not a firm believer in international development projects after twenty years of experience doing technical work. With the ABC, he was not convinced that participatory development worked, stating:

People will turn into what they perceive that you want them to be...If you come talking about ranching, they are all ranchers. Donors now want us to leave

development proposals open to what the community wants. This may not be the best method.²⁴²

The structural and technical components of viable community development plans were presented back to RAAN villages at the end of 2003. The PDC projects proposed were predominately social and only a few would directly have positive environmental consequences. The ABC would not execute any community development plans in Prinzapolka, although thirteen projects had been initiated in the other municipalities of the RAAN at the time of fieldwork. These projects were being carried out in conjunction with regional and local NGOs. The ABC National Technical Advisor suggested that Prinzapolka did not attract international donor funding because there were controversial territorial conflicts. Donors decided not to get involved until state institutions resolved land demarcation and titling. ABC donors had hoped that the responsibility for various corridors and protected areas would be assumed by foreign donors. This did prove to be true in several other areas. A project for the Bosawás Biosphere Reserve would continue in conjunction with a protected area across the Honduran border; this funding was granted from GEF, UNESCO and the German government. A large marine protected area around the Miskito Cays was covered by Proarca with funding from USAID. In the RAAS, programs in Silva Peak, Gorda Point, and the Indio-Maiz Reserve were funded by Conservation International and the Danish and German governments.

In February of 2003, when ABC consultants arrived in Prinzapolka to visit villages, municipal councilors were angered by the fact that they did not talk to them.²⁴³ They felt that they should have known previously about the arrival of the ABC, the

²⁴² Pers. comm., Spanish, 02/17/03.

²⁴³ Pers. comm., Spanish, 02/17/03.

project representatives should have asked their permission, and they should have invited a representative of the municipal government to consultations. Municipal councilors were uncertain if the data that the ABC collected would be shared with other institutions.

With localization and globalization shifts in the ABC, the integration of the intermediate levels remained poor. In the first years of the project, when donors arrived in Nicaragua, they were not brought to the RAAN. In 2000, a community leader complained that in Managua, “They invent a million excuses – there are armed groups and it rains too much – and the donors return home with just the written report that they are given.”²⁴⁴ If international representatives did visit the region, they flew in and out the same day.

At the end of 2003, there was still a general perception that donors did not know what was happening in the RAAN. When donors asked representatives in Managua to settle accounts, it was perceived that they did not give accurate information about the RAAN. Meanwhile, donor visits to the region lengthened to days or even a week, but their perceptions of the region were still filtered by their Managua contacts.

In 2003, I documented an account of a World Bank representative’s visit to the region the previous year, through the eyes of the indigenous person who accompanied him. According to this person’s detailed account, RAAN ABC officials did not arrive and so he traveled with the representative to one of the main ABC recipient villages, Twapi. Most of the villagers they interviewed were unaware of the ABC, in spite of the fact that the project had supposedly been working there for years. Upon returning to Bilwi, the two tracked down the main ABC representative, who admitted that he had forgotten

²⁴⁴ Pers. comm., Spanish, 06/20/00.

about the bank representative's visit. Nevertheless, as of March of 2005, the World Bank has consistently listed ABC implementation as satisfactory in all public status reports.

The greatest complaint in the RAAN was that most donor money was spent in Managua and very little actually got to the region. Donors believed that they were helping the poor of the Atlantic region, but RAAN ABC representatives estimated that less than fifty percent actually reached them.²⁴⁵ Large portions were spent on salaries in Managua. Most equipment was also given to officials in the capital. When questioned about the use of a vast quantity of project funds in the capital city, Managua officials responded that they must assure the continuation of programs and pay salaries. They also alleged that if they sent money to the Autonomous Region, that there would be corruption and insufficient human resources for proper administration. Regional representatives countered that national politicians made campaign promises and they resisted sending employment opportunities to the RAAN in order to provide jobs in Managua.

While the central office of the ABC was transferred to Bilwi during the last year of functioning, financial decisions were still not decentralized. Links with donors and the output of public information, such as the project website, also continued to be administered from Managua. The community development plans were sent in a draft form to Managua to be corrected before being publicized. According to a RAAN ABC official, "Decentralization is propaganda of the central government. In practice, there has not been a lot of advance."²⁴⁶

²⁴⁵ Based on my observations and interviews I expect that this percentage is actually quite less and that regional officials had no idea the amount of money that entered into the project in total.

²⁴⁶ Pers. comm., Spanish, 11/05/03.

The amount of decentralization in a particular international project depends a lot on the foreign donors and the central government ministry that they chose to work with. Swiss and Danish projects are rumored to be most decentralized in Nicaragua. However, RAAN project officials charged that whenever a national ministry heads a project, there would be centralization since the office in Managua would always have the last word.

CASE STUDY THREE: DISCUSSION

During initial ABC negotiations, there were no other GEF projects active in Nicaragua, but by the end of the project, there were ten national GEF projects, totaling more than twenty million dollars, as well as fourteen regional and two global GEF projects that included Nicaragua. While the role of the central government under the Alemán administration impeded project development in spite of donor commitment, the Bolaños government prioritized the implementation of donor projects and meeting conditions placed on loans. Nonetheless, the state still did not have the assets to assume fiscal responsibility for environmental projects started by international donors as initially hoped. While the National Environmental Fund, created as a condition on the ABC project, began to administer financial accounts related to natural resources in 2003, its ability to raise national funds still did not look promising in mid-2005.

More extensive analysis is possible on this case study than the other two because it initiated earlier and had progressed to a later stage of implementation by the time I carried out fieldwork. Overall, Nicaragua's ABC project focused on social, institutional, and economic issues rather than biological ones. The sector-based studies sponsored by the ABC focused on topics related to people, such as transportation, tourism, and production. The study of the forest sector looked at historical processes, lumber prices,

and corporations. The ABC barely made reference to the central MBC structure in terms of the four types of land use designation – core, buffer, corridor, and multiple-use zones – throughout the project. When ABC documents discussed priority biodiversity areas, they only provided a rough description of the natural habitat.²⁴⁷ Due to the previous lack of biological study in Nicaragua, most of the ABC effort consisted of creating preliminary maps of the diverse ecosystems of the Autonomous Region. Project representatives considered this as an initial step for understanding distinct ecological zones and, therefore, being able to propose management. RAAN institutions were involved in this technical process, but Prinzapolka village populations were excluded.

The social bias of the research on the ABC done to this point, and poor integration of forest attribute and composition data, makes it difficult to define ecological impacts from the project. Actual corridors are not apparent. However, the original ABC proposal stated:

The corridor itself is not defined by rigid lines on a map, but by proposed land use patterns, compatible with biodiversity conservation objectives and development needs. As a tool, the ABC is intended as an integrated framework to promote and organize local, national, and donor efforts (GEF 1997: 7).

The ABC combined several timely goals of the international donor community involved in the project. The World Bank's Country Assistance Strategy at the time of the ABC approval had four key objectives: reviving growth, reforming the public sector and strengthening institutional capacity, improving environmental and natural resource management, and alleviating poverty and investing in human capital (GEF 1997). ABC-

²⁴⁷ For example, the multiple ecosystems within Prinzapolka targeted by the ABC are listed as humid tropical forest, pine savanna, gallery forest, seasonal wetland, coastal wetland, bamboo, freshwater lagoon, estuary, and mangroves.

proposed community development plans fed into these donor priorities. As one example, the proposed community development plans for Alamikangban included projects involving forestry, land demarcation and placement of boundary markers, communal ecotourism, organic fertilizer with traditional agriculture, grain storage, livestock, transportation infrastructure, a high school, a sewing and craft school, potable water, electrification, and a communal bakery. The MBC is a large-scale conservation project that operationalized the bioregional approach through economic and ecological corridors, but the promotion of social development appeared to outpace biodiversity protection. Some ecologists criticize this process (e.g., Carr 2004).

Production projects, like those proposed under the ABC, as shown in Table 11, are likely to improve the local economy, but there is also potential for negative ecological repercussions, such as deforestation for agroforestry plantations or construction. The intensification of cattle ranching was suggested in more than half of the ninety participating villages, which could contribute to deforestation in broadleaf forests and fire setting in the pine plains to encourage the sprouting of tender grass for herds. New or improved roads, bridges, and docks in forested areas are likely to attract new logging. Infrastructure projects improve opportunities for the marketing of local products, but can also encourage the advance of agricultural frontier, as well as the potential for unsustainable extraction and production. Many proposed projects also required the use of fossil fuels, such as with rice thrashers, electrical plants, trucks, and boats. This machinery would require a steady investment in fuel, which has proven difficult for villagers to maintain with previous development projects in the region (author's fieldnotes).

The ABC was scheduled for six years. Nearing the end, in 2004, main ABC donors, including GEF, USAID, CI, and the Dutch and German governments, made future commitments involving economic and technical support to the corridor segments that they prioritized, which most often involved individual protected areas. The portioning of biodiversity ‘hotspots’ among major donors is common throughout the MBC area and around the world (Sundberg 1998b; Goldman 2004). The disproportionate focus on hotspots makes for patchy environmental program coverage, a pattern that was evident throughout the MBC. In spite of claims to prioritize connectivity (MBC 2002), certain select areas received high levels of attention, while the majority of proposed corridors grow increasingly fragmented through deforestation and other types of habitat destruction.

The Atlantic corridor should be compatible with a political regime of multiethnic autonomy. In fact, the decentralization instituted in eastern Nicaragua should facilitate local decision making. Nevertheless, initial ABC project decisions were handed down from the central government. From 1997 to 2002, there was growing concern that the ABC handed the central government more power over a region struggling to develop autonomy. Although regional leaders were eventually included, administrative processes never transferred to municipal governments or village authorities, the most decentralized institutions. Most village consultations were carried out after the ABC project was more than half finished, meaning that local populations did not have the opportunity to influence corridor policy, goals, or locations.

The ABC exhibited similarities with previous international conservation projects in eastern Nicaragua. In the 1990s, ‘co-management’ arrangements between indigenous

organizations, the state, and USAID-funded NGOs, such as WWF, marginalized local populations while strengthening state control over resource policy, management, and allocation (Nietschmann 1997)

Donors and consultants often define what will to be studied as part of preliminary project development. Research results are later used to justify increased or ongoing donor involvement. Official ABC project studies covered marine resources, mining, forestry, transportation and infrastructure, decentralization and municipal development, tourism, and rural economies and productive systems. Corridor donors are believed to have a comparative advantage in many of these areas. Thus, the development planning that these donors funded may stimulate future growth in their financial portfolios. Similarly, in the 1990s, a criticism of the Tropical Forestry Action Plans (TFAPs), a massive international environmental campaign pushed on developing countries, was that they were being used to advance future lending. Many of the same actors that created the TFAPs, such as the World Bank and the UNDP, are behind the MBC.

Although Nicaraguans in various positions and multiple governance scales did make decisions related to the ABC, my research led me to conclude that there was a high degree of foreign influence not only in the creation of the project, but also in the direction that it took. In Nicaragua, nearly all environmental project financing from the late 1980s until 2000 came from international sources (CCAD-RUTA 2000). By 2001, donors invested US\$ 114 million dollars in Central American technical assistance related to the environment, micro enterprise, agriculture, energy, social investment, sanitation, transportation, tourism, infrastructure, and land administration. Technological transfer encourages the replication of favored global project models, as was suggested with the

ABC proposed subprojects. Nicaraguan universities, where the regional ABC consultants who wrote the village plans were trained, employed international techniques. These consultants were biased towards certain projects and technology, such as fruit tree plantations, ranching, or watershed regeneration. State institutions, universities, and NGOs are inundated with conferences, workshops, trainings, and meetings where technical information is communicated. Expert opinions at these events are generally oriented around ecoefficient production and marketing of natural resources, which coincides with free trade agendas. In Nicaragua, these talkshops even occur at the village level. I have observed numerous meetings where experts funded by major development organizations including the FAO, IDB, UNDP, USAID, World Bank, and WWF teach local populations about improved seeds, product certification, or micro enterprises (author's fieldnotes). The proposed ABC projects were largely technocratic and, therefore, unlikely to have originated entirely from local populations. Nevertheless, during fieldwork, I documented previous and ongoing exposure to internationally popular agricultural inputs, such as genetically engineered seeds, and resource management models, such as community forestry enterprises or woodworking shops.

Within corridor planning, there has been insufficient attention to cultural groups, local institutions, and ecological factors. This is characteristic of neoliberal development, which is most often advanced through economic institutions, like the World Bank, who formulate programs based on financial principles and criteria. Neoliberal financial institutions' control over international development agendas, technology, and finance discourages the search for alternatives that are more sensitive to local cultures and environments. Aggressive promotion of technocratic and neoliberal models assures profit

among donors, a continuous international supply of agricultural products and natural resource exports, and science and technology transfer from industrialized nations.

The MBC provides a lens to view how neoliberal conservation is defined among a few powerful allies with shared political and economic agendas, carefully packaged, and then successfully transmitted to a whole region. Initial project assessments help development banks and donors determine how to frame additional proposals. Although state, corporate, NGO, and civilian partners are expected to approve and contribute to programs, and may be given economic incentives to do so, the power and knowledge of national and sub-national sectors is strategically limited so global agendas remain forefront. One way that this is done is through the use of cultural intermediaries (Sundberg 1998b), such as regional NGOs and technical consultants. Although these actors may be of the same ethnic group as villagers, and are often allowed to represent them in “participatory” development, their broader experiences and technical training are not common. They may not remain aware of the needs and desires of the majority of local populations. Further, their personal and professional desire to advance their career or promote a particular state institution or NGO can conflict with their representation of local populations. For example, if ABC consultants stress the need for village institutions to directly assume management of their own projects, they would reduce employment and funding opportunities for the regional government, intermediary NGOs, or outside professionals. This is a risk inherent to allowing actors in one scale or sector to represent the interest of another, since they can be biased toward a particular outcome.

In spite of the advancement of donor agendas within the MBC project, case study three both reinforces and challenges Swyngedouw’s (1997a, 1997b) claim that more

powerful agents are able to work at multiple scales. Global donors did work at many levels within the MBC to advance their agenda. However, that ability of the regional government to work in the RAAN was superior to the central government, as demonstrated through their ABC activities after decentralization, in spite of the greater power in the latter, suggesting distance can play a limiting factor, as previously noted by Morrill (1999). Issues such as the regional official's ability to carry out consultations in Miskitu were also likely to have played a role. Morrill's "tyranny of distance" and cultural linkages may in some cases work against absolute domination by higher governance scales.

CHAPTER SUMMARY

This chapter focused on the recent history of the politics of scale in three case studies of forest management. All the case studies are multi-scale, but they incorporate different governance levels. International institutions, such as multilateral and bilateral lending agencies, play a role in each. All three projects have national level linkages, although Limi-Nawâh was predominately a global-local partnership. The seed bank re-initiation was sponsored by the regional government. In contrast, ABC regional structures only became important in the last stage of implementation. Linkages with the municipal government were weak in all three cases; there was actually some conflict with Limi-Nawâh and open disapproval that ABC virtually ignored municipal structures. All projects worked in villages and tout participatory methods, but the degree of involvement at this scale was mixed.

Table 12 demonstrates that scale shifts were evident in these case studies, and that they occurred in both upward and downward directions. These changes involved give and

take from higher and lower scales. There was some agency evident at each level, but there was not necessary equal power. Shifts could be largely motivated by external actors, such as international sponsorship of Limi-Nawâh, whereby individual villages joined bloc formations. In contrast, motivation could come from within a particular scale, such as with regional actors proposing the genetic reserve to higher scales. Nevertheless, PROFOR and World Bank's investment were necessary before this upward shift could be realized. Thus, as stressed in Chapter One, there is *interdependency between processes simultaneously occurring at various scales*.

TABLE 12

Upward and Downward Scale Shifts in the Case Studies

Project	Examples of Upward Shifts	Examples of Downward Shifts
Genetic Reserve	<ul style="list-style-type: none"> Regional government proposes project to central government and international donors 	<ul style="list-style-type: none"> Donors and state officials formulate a communal enterprise
Limi-Nawâh	<ul style="list-style-type: none"> Individual villages enter into blocs 	<ul style="list-style-type: none"> International donors and business partners transfer some authority to a local board
ABC	<ul style="list-style-type: none"> Nicaragua joins the MBC Regional institutions network with national and international technical planners Village proposals promoted to national and international agencies 	<ul style="list-style-type: none"> International investment in national program Decentralization from Managua to regional governments Regional officials consult with ninety villages

Domination by higher scales in each case, in spite of the different mix of scales involved, reinforces Swyngedouw's (1997a, 1997b) assertion that it is necessary to examine the *processes and mechanisms* involved, rather than merely focus on particular material scales themselves. Thus, it is important to determine if, for example, economic, social, or ecological risk is transferred to less powerful actors in development networks. Naturally, development proposals seldom discuss what will occur in the case of project failure. If and when donors discontinue support are factors that national and sub-national populations have little power over. This creates a major power gap in development networks from the start.

The control of international actors over their time commitment is crucial. What if Limi-Nawâh industrially logs now, when MLTC receives a portion of the profit, and reforestation does not occur? Even though there was an oral commitment for twenty years of support, this is likely to be contingent on political and economic factors in Canada. Support may dissolve after the best areas are logged because a new tribal chief may not want to continue the program. Similarly, what if the genetic reserve is created, which involves significant harvesting of what is considered to be "inferior" stock, and then there is no market for the seeds, or production is not successful? Another regional government, or a central government without the temporary support of PROFOR, may not continue with its assistance. Alamikangban would be stuck with a largely deforested forest reserve. The abandoned infrastructure of the previous seed bank, located across the street from where I lived during fieldwork, was a constant reminder that projects come and go.

Network analysis was helpful in these cases because of the range of actors and activities within a scale. For example, not all foreign institutions play the same role in the ABC. The World Bank officials placed conditions on loans and forced on national policy reform. Carl Bro consultants worked with national and regional partners on mapping and “participatory” consultations. Conservation NGOs and the U.S., Dutch, and German governments financed programs within individual protected areas. These different roles within the same scale remain unclear when all are lumped as international actors. Defining their roles through linkages in a network can make these distinctions clearer.

The spatial reach of actors at different scales can also be explored through network analysis. For example, several RAAN actors were important in Alamikangban’s genetic reserve, but their ability to work in some areas of the region, such as Bilwi, was different than their reach into Prinzapolka. Leitner et al.’s (2002) territorial and thematic networks, as discussed in Chapter One, could be extended to look more specifically at spatial coverage as well as infrastructural or institutional differences. To state that a program in Nicaragua has national, regional, or municipal involvement overlooks incongruencies between locations. A town located along the main road linking Managua to Bilwi will be in a different political position than a remote village, even though they might both be targeting mahogany conservation with the same forest patch. My point is that while both locations may be considered to be within the same territorial and thematic network, they are not linked in the same way into these networks. In this work I do not attempt to diagram such differences, but I expect that more exploration of these patterns within network methodologies could be fruitful.

Young's (2002b) differentiation of horizontal linkages may assist in determining differences between actors involved in networks and those that are not, such as between villages and village blocs in Limi-Nawâh and other nearby actors at the same scale that were not project members. While benefits may be identified as a result of scaling up, intravillage linkages might include networks to improve information access as well as share administration of economic, ecological, and social activities.

Scale shifts and network configurations, while showing important political processes, cannot depict all of the changes occurring within development projects. The three cases covered in this chapter, as well as the ones in Chapter Seven, demonstrate the need to look at issues of empowerment and cultural autonomy, indigenous livelihoods and resource tenure, and the potential for ecological regeneration or degradation during the re-scaling of forest development. Tradeoffs can occur in these areas, similar to the compromises between scales. These processes are not only case specific and scale specific, there can be different results for alternative sectors or groups within a project or location (Rocheleau 1995; Rocheleau et al. 1996; Peluso 1999).

The details of the politics of scale are somewhat unpredictable and are likely to change over times. Meanwhile, the results are open to multiple interpretations, which can range widely based on the scale of analysis (Meentemeyer 1989; Meyer et al. 1992; McMaster and Sheppard 2004), as well as the training, orientation, objectives, and values of the person or people judging. These characteristics make development planning and project implementation more difficult, but they also demonstrate why multi-scale and multi-sector analysis is essential. Holistically trained geographers are in an excellent

position to document and communicate this type of variation and complexity, as are interdisciplinary teams of analysts.

CHAPTER SEVEN

Certified Forests, Networks, and Mills

The case studies in this chapter supplement the findings from the three case studies presented in the previous chapter. They provide examples of market-oriented community forestry, communal governance of resource firms, and the merging of communal, public, NGO, and private institutions. This chapter gives special attention to the role of external institutions and issues of equity in land tenure and resource use.

By 2004, there were nearly 700,000 hectares of certified forest in Central America, but only two percent were located in Nicaragua (WWF 2004a). Nicaraguan lumber certification was delayed for a series of reasons, including political instability, land tenure conflicts, and poor forest management practices. There is a large gap between legal or illegal extraction of select precious species, such as big-leaf mahogany, and technically-sound forest management as stipulated under Forest Stewardship Council (FSC) certification.

There was slow progress on the establishment of a national initiative for voluntary forest certification in Nicaragua between 1996 and 1998. Then, with the crisis of Hurricane Mitch, the initiation of the process was postponed because many groups active in the initiative became wrapped up in emergency assistance. Progress advanced after the FSC's certification of Nicaragua's first forest management unit in 2001. The WWF and World Bank's combined campaign in support of certification started around the same period. These two allies started an initiative focused on indigenous forest management in the RAAN as a poverty reduction strategy (WWF 2003a). A core leg of the strategy was certified lumber sales. All sawmills the WWF and World Bank supported are included in

this chapter, along with another sustainable forestry network, because there was considerable effort to create community forestry projects that could eventually receive certification.

Scientific Certification Systems (SCS) and SmartWood, of the Rainforest Alliance, are the two U.S.-based FSC-accredited certification bodies working in Nicaragua. The plywood company PRADA first applied for FSC certification in 1999, but they did not even come close to passing necessary criteria, according to a SmartWood representative I spoke with in July of that same year. MADENSA also underwent preliminary evaluation but was not approved. In 2001, SCS certified the Úbeda Brothers' forest concession was certified. Its location in Prinzapolka is shown in Map 2 along with the other mills discussed below.

The Úbeda Brothers also hold the first Nicaraguan chain of custody certificates, which can be used to trace the movement of their products. The Úbeda Brothers began purchasing forests in 2000 and began extraction from these areas in 2001. The company was certified after its first solicitation. Startup funds came from the Úbedas' Las Banderas sawmill located just outside of Managua, which opened in 1993. They received technical support from two Costa Rican institutions: the Center for Higher Education and Research in Tropical Agronomy (CATIE) and Portico, a door-building company with more than a decade of certification experience that exports Úbeda products. Portico is located in the Atlantic of Costa Rica, where it has logging concessions, and works with investment from Premdoor, a Canadian door retailer. Portico also has an office in the U.S. and has successfully cut down on the number of middlemen in the sales process.

Finished products are sold to Home Depot, the world's largest home improvement chain store and a frontrunner in certified wood sales.

In 2003, Portico maintained an accountant in Nicaragua and had paid an on-site forester's salary for the Úbeda Brothers to help the company's Nicaraguan foresters become ready to take over. All other workers were from the RAAN, except one trained extractionist. According to the company field manager, local indigenous people were not employed, although a few were hired in 2001.²⁴⁸ During the three months of harvest in the dry season, there were more than sixty seasonal workers, including truckers who were either company employees or independent contractors. The company paid around three dollars a day plus room and board per day for logging assistants and slightly less for truck assistants. Unlike many logging operations in Nicaragua, workers had insurance policies, protective equipment, and medical coverage.

The company harvested an average of three trees per hectare from its concession per year (2001-2003). Andiroba was the most important species. The Úbeda Brothers attested that they were constantly looking for new clients, as well as additional markets for other species.²⁴⁹ A company forester claimed that there was not always a better price for certified wood, although some companies preferred it and purchased it before uncertified.²⁵⁰ It was hard for a Nicaraguan company to enter the certified wood market. Like companies without certification, Úbeda worked through intermediaries.

The total land in the concession was 3,892 hectares – 189 hectares were in pasture and 209 were under cultivation. With approximately 3,500 hectares for forest extraction,

²⁴⁸ Pers. comm., Spanish, 05/01/03.

²⁴⁹ Pers. comm., Spanish, 01/23/03.

²⁵⁰ Pers. comm., Spanish, 05/01/03.

the concession was quite small, which makes the overall cost of certification high in relation to any potential economic benefit from lumber sales.²⁵¹ The Úbedas wanted to purchase adjacent or nearby parcels, but there were many colonists and burning along the agricultural frontier made it difficult to find healthy forests tracts of substantial size.²⁵²

Company foresters believed that they could manage the forest better than the local agriculturalists.²⁵³ However, there were negative ecological consequences due to the construction and maintenance of the company road, as it appeared to have encouraged new slashing and burning in the area. Fires blazed on both sides of the road to the logging camp during my visit in early May of 2003. The road also facilitated access for loggers and intermediaries who did not have the same standards as the Úbeda Brothers.

In spite of the impressive high-quality technical management of the Úbeda plot, this case study suggests that the certification process is not always sufficient. Experienced auditors visited the concession on three occasions and interviewed national and regional officials before approval (SCS 2001). In the past decade, three indigenous villages, including Alamikangban, have made claims to different parts of the concession area. Speaking to indigenous people about this situation could have been clarified before certification, but evaluators flew into the extraction unit by helicopter and spoke primarily to non-indigenous residents where the lumber storage patio was located, outside of Prinzapolka in a neighboring municipality.

²⁵¹ Issues of scale are relevant to the implementation of certification. Due to the high costs of certification per unit of lumber produced, it is harder for smaller enterprises to become certified due to a diseconomy of scale. To resolve this constraint, there has been movement towards group certification so that smaller units can scale up to be accredited as a block. In Nicaragua, WWF was offering to help smaller forest enterprises to organize clusters and eventually pursue group certification.

²⁵² Pers. comm., Spanish, 01/23/03.

²⁵³ Pers. comm., Spanish, 05/01/03.

While the Úbeda Company worked legally on private land plots, less than two decades ago these areas were communal. For FSC certification, firms must not encourage transition away from indigenous systems. The Úbedas did not. However, they were working on historically indigenous land even though it was void of legal protection. There was no compensation to indigenous populations after the privatization of this portion of their untitled land between 1995 and 2000 into fourteen individual farms. Likewise, they were entirely excluded from the Úbeda management process after the company bought these private plots. This case study demonstrates that the lack of land demarcation is an impediment to indigenous forestry that national and international institutions have not adequately addressed. This case study contributes to prior concerns over issues of equity in certification, as mentioned in other international cases (Markopoulos 2003; Thornber 2003), with indigenous and rural populations being some of the most disadvantaged.

Six of the private farms had been granted agrarian reform titles and the other eight were granted dominion titles, supposedly after extended occupation and material improvements to the land. These new landowners then turned around and sold to the Úbedas in 2000; five sold their land the same year that they became owners. When the land was purchased, these owners were not living onsite and a company forester told me that there were no houses or infrastructure.²⁵⁴ This is an important point because to legally receive dominion, the applicant should be living on the land consistently and make homestead or production improvements, which should be verified by the court. Needless to say, these land transactions did not transpire according to the law.

²⁵⁴ Pers. comm., Spanish, 05/01/03.

Chapter Four discussed the early years of PRADA's functioning in the RAAN. On June 15, 2003, PRADA received international certification from SmartWood for two adjacent forest areas within Prinzapolka. This is an example of clustering or scaling up to create an economy of scale in certification. One area was 4,950 hectares of indigenous communal land owned by Layasiksa, which is shown in Map 2.²⁵⁵ In 2003, PRADA had twelve additional harvest areas that were not evaluated by SmartWood. Many were located on indigenous land.

The case of Layasiksa was conflictive because in 2000, PRADA created a management plan with the village of Kukalaya, which was attempting to claim land supposedly belonging to the other village. The original village of Layasiksa was originally located along the sea coast, but with this incursion on their land, as well as other threats from non-indigenous colonists, Layasiksa split and a portion of the population moved to the forest area called La Potranca where the PRADA concession was located. During fieldwork, there were two Layasiksa villages (I and II), as discussed under multi-village blocs in Chapter Five.²⁵⁶

With only 1,960 hectares legally titled, Layasiksa demanded title to a total of 56,000 hectares. Most of this claim was recognized by regional institutions in 1997. Layasiksa took over the management plan that Kukalaya had with PRADA, but they were not happy with some of the conditions. There was an agreement to hire community members, but PRADA brought in other people to work. The company only paid six

²⁵⁵ Of this area, 4,500 hectares were productive, 450 were unproductive, and 450 were protected. Another nearby private farm that PRADA owns was also certified. Of its 4,282 hectares, 1,720 were productive, 1,662 were unproductive, 800 were deforested, and 100 were under protection.

²⁵⁶ There was deforestation due to the migration to Layasiksa II. New agricultural areas were created and houses were built from the surrounding forest products.

dollars per cubic meter for all tree species. Since the management plan continued to be valid, Kukalaya was still cutting trees from the area and selling them to PRADA in 2002.

Under Nicaraguan law, for a community to enter into a logging contract, they must legally cede their land rights for the period of the management plan. As long as this rule applies, there cannot be co-management in Nicaragua because villagers are removed from the management process and only receive token economic benefits. Since villages usually lack the investment to pay for the management plan without corporate sponsorship, Nicaraguan forest policy, therefore, impedes indigenous management of communal resources. Certification policy, as previously mentioned, often adds another layer of constraints for indigenous populations because the formal, inflexible rules often contradict local tenure regimes.

Although the certification of PRADA received some support from international, national, and regional actors, it has created significant controversy in Nicaragua (author's fieldnotes). Many of my informants told me that the company had created one model area for certification, but continued poor extraction practices in others. A local forester attested that he believed that PRADA did not have good forest management practices and that the company got certification because the owner was economically and politically powerful.²⁵⁷ In fact, during interviews, many people in RAAN, knowing the company's illegal practices in the past, suggested PRADA was certified because representatives paid off the inspectors. PRADA's certification may have damaged the reputation of SmartWood and certification in general in the RAAN. In mid-2003, SmartWood's

²⁵⁷ Pers. comm., Spanish, 11/17/03.

decision was rejected by RAAN officials. A member of the directive board of the regional government stated:

The organizations that are in charge of granting forestry certification arrive at the Nicaraguan Caribbean Coast like parachutists and they don't take into account the regional, local, and communal authorities at the hour of evaluating the companies that are dedicated to the extraction of wood (as quoted in Jarquín 2003b: 9b; translated by author).

He continued, "If these certifying organizations are directed by serious and professional people, surely they had heard about the irregularities committed by PRADA in forest use." In this case, there was considerable agreement among sub-national governance scales that PRADA's certification was inappropriate. The vice-mayor of the municipality where PRADA's large plywood mill was stationed charged that due to the irrational exploitation of the forests by this company, "I don't understand the criteria taken into consideration when giving it forestry certification" (as quoted in Jarquín 2003b: 9b; translated by author). According to a RAAN INAFOR representative, "The country is not prepared yet to meet international requirements for certification."²⁵⁸

Nicaragua's state environmental attorney admitted that he was uncomfortable commenting on PRADA's certification. He said, "We are investigating all lumber companies and while we do not have clear, reliable, and precise information, we cannot evaluate this type of event" (as quoted in Jarquín 2003b: 9b; translated by author). This could be interpreted as cautious professionalism on the part of a public official, or as an excuse to not comment. One of the most popular topics during discussions of RAAN forest activities, even with INAFOR officials, was how the owner of PRADA had high political connections and state officials were hesitant to begrudge him.

²⁵⁸ Pers. Comm., Spanish, 11/19/03.

Those that support PRADA's certification, such as WWF, noted that the company made vast improvements in its extraction practices and invested heavily in the Layasiksa concession to create the proper infrastructure, such as roads and logging camps. These organizations believed that firms should be given the opportunity to improve. Since PRADA was the largest company in the RAAN, and extracted in various areas, their higher standards could make a considerable difference in regional forest management. Moreover, the certification process forced PRADA to improve treatment of local workers with insurance, medical assistance, and social security. This was a pre-condition required for the FSC approval process. It included the retroactive payment of social security for workers. One of the ways that FSC certification enforces the improvement of forest management practices is with the use of pre-conditions and corrective actions (Elliott 2000). When a producer is evaluated, they can be unconditionally certified, certified once pre-conditions are completed, certified with an agreement to complete corrective actions, or denied certification. If certified with conditions, the certifier makes periodic repeat visits to assure corrective actions are completed. Concessions require periodic re-certification to assure that standards are maintained.

PRADA received international technical support during its certification process to meet the other two pre-conditions given from SmartWood. WWF, the World Bank, and Proarca (USAID) assisted PRADA to complete an environmental impact assessment. WWF, CATIE, and the University of Oregon helped PRADA to meet the last pre-condition, which included ecological and social studies.²⁵⁹ In addition to the three pre-

²⁵⁹ Representatives from PRADA received trainings from CATIE, WWF, and others on low-impact harvesting. CATIE helped establish permanent parcels to improve long-term management and collection of research data.

conditions, SmartWood determined thirty-one conditions (corrective actions). These aspects would be re-evaluated at the end of a defined period, which was usually either one or two years.

PRADA previously utilized as many as twenty-four different tree species in its plywood. However, with certification, the company increasingly focused on primary transformation of hardwood boards. Although they identified seventeen commercially viable species in the Layasiksa concession, they were not able to find consistent markets for each. Thus, PRADA used less tree species after certification. I am not aware of international research on transitions in species use as a result of certification, but these may be interesting to document. Changes in policy and target markets are likely to influence forest use and could translated into less or more extraction pressure on particular trees.

THE WORLD WILDLIFE FUND/LAYASIKA PARTNERSHIP

The Central American office of WWF was created more than fifteen years ago. WWF opened an office in Bilwi in 2002 and has been assisting Miskitu villages in the RAAN to create community forest enterprises and obtain FSC certification. Additional funding for WWF and the selected villages came from PROFOR, the Ministry of Agriculture, Livestock, and Forests (MAG-FOR), the World Bank, the Ford Foundation, and U.S. and Swiss aid agencies. The RAAN government assisted these efforts as well.

WWF initially started work in Nicaragua in 1988 with a marine reserve project. WWF leaders noticed that past projects, including this RAAN protected area, left few concrete results (Gretzinger 2003). When initiating RAAN forestry projects, organizers looked for a new strategy. Their objective transitioned away from the single focus on

conservation to a broad economic transformation whereby the market would stimulate indigenous producers, firms, and the state to voluntarily assume extra costs for sustainable management.

The RAAN did not have experience with community forestry so WWF wanted people to learn from other Central American nations. In July of 2002, WWF hosted an interchange of experiences in El Petén, Guatemala. RAAN representatives saw that Guatemalans were managing their own forestry concessions and receiving benefits. Describing the experience, a Prinzapolka participant said, “If they are able to do that, why not us in the RAAN, too? We are forest owners, so why should we be dependent on companies?”²⁶⁰

According to a WWF forester, the RAAN site selection process was lengthy.²⁶¹ Over five months, WWF representatives visited twenty villages and performed rapid diagnoses of local conditions. The analyses included forest potential, community organization, socio-economic factors, and forestry tradition. The villages of Layasiska and Sangni Laya were chosen.²⁶² My research focused on Layasiksa because it is located in Prinzapolka, as depicted in Map 2.

The partnership with WWF focused on five components: forest management, environmental monitoring, marketing, stable financing, and strengthening the technical capacity of the community. Village members received training in commercial censuses, maps, GPS, compass use, directional felling, and milling. WWF worked with Layasiska

²⁶⁰ Pers. comm., Spanish, 08/30/03.

²⁶¹ Pers. comm., Spanish, 11/17/03.

²⁶² Originally chosen in the place of Sangni Laya, Awas Tingni was later rejected because of its tenure conflict with the state. Sangni Laya is a multi-village bloc located in Waspm.

to write a five-year development plan that defined cultivation, production, conservation, and research areas in 35,000 hectares of broadleaf forest. WWF originally thought that they would assist with a plan for 7,000 hectares, but once they determined reserves, existing management plans, and unproductive areas, it ended up only being 4,600 hectares.²⁶³ Nonetheless, WWF facilitated the environmental impact assessment for all 35,000 hectares based on a petition by the community. This assessment later passed before the RAAN regional government. This is evidence of decentralization. Previously, it would have needed to be approved by the central government's Ministry of Finance.

WWF completed a commercial census with thirty-two Layasiksa community members over a month. They wrote the general forest management plan and 2003 annual plan in March of 2003. After receiving the signature of Prinzapolka's mayor and the RAAN government, the plans were sent to INAFOR for approval, which was granted. Layasiksa negotiated with an extraction company, PRADA was the purchaser, and WWF acted as an advisor for Layasiksa's sindiko. Layasiksa received a price three times what they were earning before they did their own planning, measuring, and coordination. This was a new contract model because it gave jobs to villagers.

According to a project leader, a problem arose.²⁶⁴ Layasiksa had to rent equipment, because donors would not fund machinery, from a local extraction company who worked with financing from PRADA, and was in crisis. The extractor agreed to haul for Layasiksa, but for two weeks from the agreed upon date, he did not come, and the day

²⁶³ Pers. comm., Spanish, 11/17/03.

²⁶⁴ Pers. comm., Spanish, 11/19/03.

he finally entered, it rained. Layasiksa had to leave eighty-five trees cut, including some mahogany, because the road was destroyed and the seasonal rains had begun.

WWF-Bilwi's director considered the project a success even though Layasiksa did not sell any lumber.²⁶⁵ He recalls asking community members to determine what they would be paid for a ceiba tree (*Ceiba pentandra*). They thought \$180 would be a lot of money, but the tree's value under their new agreement was \$564.

WWF was beginning to be known across the RAAN. WWF representatives expressed their readiness to expand work to other areas by the end of my fieldwork. Layasiksa was almost ready to apply for international certification. They had met core requirements with the environmental impact assessment and forest management plan.

Natural forests in the tropics have not been certified at the levels expected. It is economically and technically unfeasible for many indigenous and rural groups to write management plans for the harvest of their forests. With the added costs and technical requirements to meet criteria for international certification, these communities face further constraints. The pre-certification process in Layasiksa required extensive financial and technical support from WWF and others. While Layasiksa's progress suggests that communal certification in eastern Nicaragua can be developed, it also shows the likelihood that outside organizations would need to assist village efforts. Each indigenous village with forest holdings will probably not receive sponsorship, which creates potential inequity.

In an evaluation of the past ten years of certification and its impacts, Rametsteiner and Simula (2003) conclude that the original intention of using certified forestry to save

²⁶⁵ Pers. comm., Spanish, 11/19/03.

tropical biodiversity has largely failed. Only roughly ten percent of certified areas are in the tropics. Yet, certification has been very successful, they conclude, in raising awareness and disseminating knowledge on sustainable forest management and the need to include economic, environmental, and social criteria. In the long-term, certification may contribute to better forest management practices at a global level. In 2003, the Úbeda Brothers and PRADA were the only companies with certification in the RAAN. This limited RAAN experience suggests that there could be social and ecological benefits; yet, it also points to continuing problems within the process. A clear concern is that *without major outside support, certification is unrealistic for indigenous producers. Does international certification allow for too much external control?* Regional, municipal, and village leaders thought this was case in SmartWood's certification of PRADA. With the Úbeda Brothers' concession, there appeared to be insufficient knowledge on the part of foreign certifiers in terms of local tenure conflicts and questionable privatization practices. I am not aware of international research on these issues, but I look forward to further exploring patterns between certification and land tenure in the future. During fieldwork, the Úbeda Brothers' and PRADA's concession were the only certified areas on communal lands in Nicaragua, although with the recent work of WWF and others, I expect this to change.

THE PINE EXPORT COMPANY

A project with more recent WWF support is located in Las Crucetas, Prinzapolka. Shown on Map 2, the Pine Export Company (CEPISA) started in 2001. The company gained sponsorship from PROFOR, USAID, and other international donors. People from

Central American organizations, such as Proarca and CATIE, consulted for the project while experts on Honduran pine production came to evaluate the site.

Dipawala was the original community, or small group of households, where the new village of Las Crucetas was created by invasion in 2001 (see below). The four villages of Auka Mango, Betel, Tuburus, and Las Crucetas/Dipawala were listed on CEPISA's PROFOR proposal. However, the villages other than Las Crucetas have swung back and forth in their support since 2001. Other villages wanted to share control and they wanted their land rights recognized. Hale et al. (1998) documented conflict between village representatives in this zone dating back to the late 1990s. Chavelo Andrews, the founder and legal representative of the pine export company, dominated it from the start. According to a local sindiko in February of 2003:

Chavelo still hasn't held community assemblies. The communities want to be involved in the decisions. There was only one communal house in Las Crucetas when the other communities already existed, now Chavelo is trying to claim all of our land... We never asked Chavelo to represent us. It's all lies.²⁶⁶

During my fieldwork, Andrews lived in Bilwi, but was considered a member of Las Crucetas. However, there was doubt about the land title being used by Andrews.²⁶⁷ According to the Prinzapolka judge, Andrew's father was granted title to a couple hundred of hectares. In 1998, Andrews received a supplementary title for 15,480 hectares, but based on the judge's opinion, he had not met various legal requirements for this deed.²⁶⁸

²⁶⁶ Pers. comm., Spanish, 02/14/03.

²⁶⁷ Andrews created earlier conflict over land in the municipality. He claimed to be the sindiko of Prinzapolka Bar and was accused of taking lands from other neighboring communities (IPADE 2001).

²⁶⁸ Pers. comm., Spanish, 02/14/03.

The conflict near Las Crucetas increased in February of 2003 when Andrews used the rights granted under his forest management plan to decommission lumber cut by Auka Mango villagers. The sindiko stated:

We don't want problems with Chavelo because we want the project to come, but we are angry that Chavelo is trying to decommission our wood. We are going to the judge to try to halt the process. We don't want Chavelo to stop our rights so that we can't cut wood.²⁶⁹

Andrews claimed to have met with other community leaders and have their support, but the main stakeholders recognized by PROFOR and international donors were fifty-three Miskitu families, many who are related to Andrews and moved to Las Crucetas after the project received approval in 2001. These families formed a village where a few homesteads were historically located in Dipawala. They have been able to use this historical settlement to claim traditional inhabitation when, in fact, most were new migrants from other Miskitu villages to the north, including Layasiksa II. Andrews included the other villages of Auka Mango, Betel, and Tuburus in order to receive a large-scale forest management plan, but the project leaders were from Las Crucetas. Most core company officials were from Andrews' immediate family.

There was some disagreement over the legal structure of CEPISA. According to the WWF-Bilwi director, CEPISA was a family business.²⁷⁰ He admitted that there was not a history of this structure in the region, but national bodies wanted individuals legally responsible for donor resources. Donors had worked with community businesses in the past and after incidences of corruption, no one was legally responsible because materials were not assigned to a legal entity. In contrast, a PROFOR leader insisted that CEPISA

²⁶⁹ Pers. comm., Spanish, 02/14/03.

²⁷⁰ Pers. comm., Spanish, 11/19/03.

was a community business and that when PROFOR left, materials would be the property of the Las Crucetas and not the Andrews family.²⁷¹

The Prinzapolka mayor's office approved CEPISA, which successfully moved through legal channels in Nicaragua. National and regional representatives held public consultations. One consultation involved ten community members from the villages other than Las Crucetas, but their land concerns were not mentioned in the meeting report. According to a RAAN official, at another consultation, all the participants that attended were from Las Crucetas. It was deemed too expensive to travel to the other villages.²⁷² This practice was considered acceptable because donor guidelines stipulated that consultation had to occur at the site where the mill would be developed.

CEPISA's large management plan covered 11,200 hectares in an area where there were multiple claims and land tenure was officially undesignated. Since the creation of the project, Las Crucetas gained hegemony over other nearby villages due to the assistance of international donors and the state. In a demonstration of physical control over the space, families in Las Crucetas were rapidly clearing land to build houses, a school, and a church in 2003.

An elder in Auka Mango had a disagreement with Andrews over the project. In relating the story, he remembered that he had told Andrews, "You are not going to beat me, I speak Spanish, too."²⁷³ Other nearby villages, although they were considerably larger, had few political, economic, and human resources. In 2002, village leaders from Auka Mango solicited the support of the sindiko of the multi-village bloc called Siks

²⁷¹ Pers. comm., Spanish, 12/01/03.

²⁷² Pers. Comm., Spanish, 11/05/03.

²⁷³ Pers. comm., Spanish, 08/20/03.

Tawan, of which Auka Mango, Betel, and Tuburus are part, in their complaint against Andrews for decommissioning their lumber.

In 2003, thousands of dollars of international assistance were assigned to Las Crucetas as the site of CEPISA. Officials suggested to me that those that were able to meet donor conditions, such as forming a company, deserved assistance, while those that could not should not contest the benefit of others. Therefore, those who stayed in the area, in spite of a civil war and extreme poverty, and maintained traditional ties to land as subsistence farmers, have fewer rights than Andrews, who abandoned the area for two decades. As a result of leaving, he was able to obtain the skills and assets necessary to form CEPISA. Andrews networked in Bilwi. Later, in Managua, he was able to scale up to attract national and international support.

Supporters of the project within WWF-Bilwi believed that nearby villages needed to recognize efforts made by the Andrews family to bring investment to area.²⁷⁴ Although land tenure issues had not been fully resolved, a state official in Managua suggested that it would be a shame for this project to fail because it was one of the few examples of indigenous-run forestry in the nation.²⁷⁵ He believed that even if projects were not ideal, it was necessary to support them to prove that community forestry was possible in Miskitu villages.

CEPISA's approval process was completed in late 2003, but PROFOR offices in Managua were not willing to risk transporting materials to Prinzapolka until the rains lessened in March or April of 2004. According to a Managua PROFOR representative in

²⁷⁴ Pers. comm., Spanish, 11/19/03.

²⁷⁵ Pers. comm., Spanish, 12/01/03.

2003, opposition to the project and Andrews would dissolve when the mill was installed and the company generated work.²⁷⁶ She believed that it was difficult for Andrews to adequately consult with the population since he lived elsewhere. She suggested that when local people saw direct benefits, they were going to be in agreement. I am eager to test her assumption once the mill is created and has been functioning for a period of time.

Since community sawmills have the potential to address a wide range of rural development problems, they have generated considerable enthusiasm around the globe. Community businesses are politically and socially complex and they may build on existing inequities within or between villages. Even before materials reach a village, there can be problems related to distribution. Donors want assurance that project assets will not be misappropriated, but if strong local institutions do not exist before a project enters, there may not be a reliable system of checks and balances. *Institutions that are created for the management of external aid may enforce donor agendas, or they may be manipulated by local actors who want to control foreseen community earnings.*

The final case study is the Network for the Promotion of Sustainable Forestry in the Mining Triangle and Prinzapolka (REPROMAB). This network aimed to facilitate forest management partnerships leading to social and ecologically beneficial extraction and to FSC-certification. REPROMAB promoted community sawmills and co-management with indigenous populations. It received funding and technical support from CATIE in Costa Rica and the Swiss Agency for Development and Cooperation (COSUDE). The Technological Transformation and Promotion of Natural Forest

²⁷⁶ Pers. comm., Spanish, 12/01/03.

Management Project (TRANSFORMA), organized under CATIE, oversaw REPROMAB.

I observed interactions between the various sectors within REPROMAB during three assemblies in 2002, but the network dissolved in 2003. Important lessons can be learned from unsuccessful projects. I think that REPROMAB failed because of donor dependency and the inability to reconcile different goals in different scales and sectors. In addition, the policy environment during the Alemán administration was not supportive.

In 2001, REPROMAB began working with logging companies, private landowners, indigenous villages, sub-national state officials, NGOs, universities, and forest professionals. REPROMAB was one of TRANSFORMA's four pilot projects in Honduras and Nicaragua. TRANSFORMA's philosophy was to encourage participants to scale outward in a non-hierarchical network to achieve objectives that would be unobtainable if they worked in isolation.

TRANSFORMA began to work in the RAAN in 1998 when they began the Forest Management Network (REMAB) in Bilwi. According to a regional forester, who ran REMAB for four years, INAFOR was tightly allied with companies during this time. He stated, "REMAB couldn't work because nobody wanted to pressure the companies – they were all working together."²⁷⁷ In 2001, TRANSFORMA moved its project to INAFOR's district two and started REPROMAB.

REPROMAB suggested a general match between ecological and institutional scales. Organizers wanted to work at a governance scale that included a large broadleaf forest and to define best management practices as a whole. Previously, each municipality

²⁷⁷ Pers. comm., Spanish, 02/17/03.

had an annually permitted volume for extraction. REPROCAB foresters wanted to group the four municipalities (Rosita, Bonanza, Siuna, and Prinzapolka) and define extraction patterns and levels based on the whole area. With strategic concession areas, it was proposed that the network could impede the advance of the agricultural frontier, which was defined as the greatest source of regional deforestation and a major threat to both the logging sector and indigenous communities. REPROCAB leaders also suggested situating industry closer to forest sources. Most mills were in the central and Pacific regions of Nicaragua, while the greatest amount of lumber was harvested from the Caribbean region. Nonetheless, REPROCAB did not exactly fit with ecological processes because the area was essentially determined by municipal jurisdictions.

According to REPROCAB's leaders, decentralized co-management could facilitate stakeholder partnerships, but interaction was limited among network members. REPROCAB found working with multiple scales and sectors challenging because each lobbied nearly exclusively for its particular needs. Tensions between the state, businesses, and indigenous villages were high in some meetings. The least committed to the network appeared to be logging companies and indigenous groups, potentially the two most important groups. The former was accustomed to lobbying independently, and the latter was inexperienced at working in networks and distrustful of other actors.

There were patterns evident in indigenous participation during the events I observed. First, the Sumu-Mayangna populations that participated articulated their complaints more than Miskitu participants. Second, invitations were not issued systematically and the representation of indigenous villages was patchy. Third, participation was influenced by distance and transportation infrastructure. There was

strong attendance from villages near major roads, such as Layasiksa, Kukalaya, and Wasakin, and poor representation from remote places. People from Prinzapolka were willing to attend assemblies when there were travel grants, as occurred in the first meeting, but they were not willing to spend their own funds to attend. This was especially true for people living a distance from Alamikangban due to the time and expense of travel.²⁷⁸

At the first assembly I observed in 2002, there were two processes that I felt were disempowering to indigenous populations. First, the meeting was conducted in Spanish because organizers stated that they did not want to waste valuable time with translation when most people understood. Indigenous populations insisted on bilingual proceedings, and the second two assemblies I attended were translated.²⁷⁹ Second, a full afternoon was spent analyzing and commenting on technical by-laws. This was necessary as the organization's legal structure had to be approved by a quorum of members, but the majority of the participants in the assembly had difficulty with the legal jargon used.

REPMAB attempted to be horizontal, but did not create equal power. It did, however, create an opportunity for indigenous populations to negotiate. At the end of the large forestry forum in November of 2002, a representative from each sector (the state, NGOs, indigenous villages, businesses, forest professionals, and private landowners) was

²⁷⁸ For example, participants from the east of Prinzapolka did not attend. This population was more connected to Bilwi, which was reached by sea in several hours, than the Mining Triangle, which required days of travel by river and dirt road.

²⁷⁹ Men made up the majority of REPMAB participants. Although most RAAN indigenous men do speak Spanish, those advocating for translation pointed out that some were hesitant to make public statements in Spanish, which would deter their participation if there was no translation. It was also pointed out that some people required translation due to the technical terms used in discussions. The translators were cultural intermediaries (Sundberg 1998a) who explained forestry terms, which lacked direct parallels in Miskitu, in words villagers understood. Although there were Sumu-Mayangna populations present the Miskitu language was used. Most Sumu-Mayangna individuals speak Miskitu. The inverse is not true.

elected to oversee the follow-up of the recommendations made at the forum. Like the other sectors, indigenous populations were initially granted one representative. They wanted to choose four because they believed that the area was large and it would be impossible for one person to consult with and represent all the different villages. The indigenous participants threatened to withdraw from REFROMAB, at which time a vote was taken and indigenous demands were approved. This incident demonstrates that some indigenous populations have learned the art of political maneuvering and can achieve their demands when they participate in large numbers. Unfortunately, there was no follow-up from the forum.

At the same event in November of 2002, another incident potentially demonstrated an on-going concentration of power, although with the complacency of some indigenous populations. There was a rumor, which I was unable to verify, that a group had come from Layasiksa with the intention of denouncing PRADA's interactions with the village in front of the assembly, which included three international participants and one central government representative (author's fieldnotes). I observed PRADA's lawyer speaking with this group during a break and then they disappeared. Indigenous participants later told me that the lawyer had given Layasiksa's leaders money in exchange for leaving and not speaking publicly against the company. I could not verify this information because Layasiksa representatives had already left, although I had heard them complain about the company earlier the same day and on other occasions. Whether or not this rumor was true, I observed state and business sectors being submissive to PRADA's owner and lawyer throughout the assembly, which suggests that

REPROMAB's intended dissemination of power in a horizontal structure did not develop.

Project advancements slowed after the regional forestry forum in November of 2002, which was well attended by regional and municipal leaders, sindikos from Miskitu and Sumu-Mayangna villages, NGOs, logging corporations, and even international supporters. Although invitations were issued, the central government was poorly represented (author's fieldnotes).

Lack of support from the national government was a major project constraint. REPROMAB waited for more than a year for the approval of its by-laws in the National Assembly. According to a project leader in early 2003, the by-laws entered before the environmental committee, but did not go before whole assembly.²⁸⁰ The National Assembly did not make time to vote on REPROMAB because they did not view it as a priority. REPROMAB could not fundraise without by-laws and, therefore, was severely limited in its functions. This was especially true after financial support from TRANSFORMA ended in May of 2003.

TRANSFORMA brought REPROMAB to the Mining Triangle and Prinzapolka and, while external funding continued, the network functioned. Although leaders encouraged participants to utilize the technical and practical knowledge within the network to write grant proposals for future projects, this did not occur. Donors had hoped that regional or local groups would take responsibility for managing REPROMAB, but when they left, there was no continuity.

²⁸⁰ Pers. comm., Spanish, 08/21/03.

In addition to the concerns presented above, REFROMAB's constraints included low human capacity, low economic investment, inefficient technology, poor access to and knowledge of lumber markets, and land tenure or resource disputes. These are sector-wide problems that are difficult for forestry projects to correct. Certified lumber faces the same types of constraints, especially since most logging firms in the RAAN merely survive year to year and do not have excess funds for long-term investment.

SUPPLEMENTARY CASE STUDIES: DISCUSSION

The cases are still largely oriented toward production forestry rather than risk spreading (*sensu* Lindenmayer and Franklin 2002), which may not in the long-term provide sufficient protection to local livelihoods or forest biodiversity. Like the projects in the previous chapter, these cases show that there are many challenges for market-oriented projects working in communal areas of developing countries. Forest certification networks largely exclude indigenous populations. Groups such as WWF attempt to provide additional support to villages such as Layasiksa, but this may not be a sustainable philosophy because it does not address constraints within the FCS structure and so each village attempting to undergo certification will require significant assistance to meet global standards and compete in international markets.

After reviewing these cases, I propose that the analysis of horizontal linkages, as discussed in Young (2002b), deserves greater attention. In the case of CEPISA, disjuncture in power among horizontal actors existed as a result of the project structure. I think that this occurred partially because outside support agencies did not have sufficient understanding of local institutions and tenure, and yet were willing to define the project structure and area.

Although Limi-Nawâh and CEPISA both involved communal firms and a series of horizontally linked villages, the scaled up structure in terms of the multi-village board of directors and project officials in Limi-Nawâh may be better able to oversee questions of equity between local actors than in CEPISA. In the latter, I think that there was donor bias toward assuring safety of their investment in equipment rather than creating a level playing field for the villages and families involved.

Within state agencies there are differences in clout, even among entities at the same scale, and this can impact project outcome. As an institute under Nicaragua's Ministry of Agriculture, Livestock and Forestry, INAFOR is not particularly powerful. Actors in the executive and judicial branches of Nicaraguan government have personal interest in profits from logging in the RAAN, as discussed in Appendix Four. For this reason, the sustainable logging network as envisioned by REFROMAB, which received considerable support from INAFOR at various scales, was held up by the National Assembly. This case suggests that the state can impede progress in spite of international networks, which would contrast with much globalization theory. However, in looking at the details of the case study, this may be because Central American donors, such as CATIE, are less powerful internationally and do not have economic strings to pull, like the World Bank. Such international actors, therefore, are not as able to shift scale to their advantage the same way as global donors do in other cases. As a result, I suggest the need for differentiation within the international scale. I propose that there are many scales represented by "international." It would be helpful to point out the differences between regional (e.g., Central American), hemispheric (e.g., north, south, east, or west), and global networks, along with other possible differentiations, such as bilateral or

multilateral associations. I propose that identifying the multiple “scales” within the international level could help as an analytical starting point. Currently, a range of actors are lumped together.

There are practical lessons from the analysis of the supplementary cases in this chapter. Each demonstrates the slowness and difficulty of project development. All involved compromises and tradeoff between groups, scales, and goals, such as national and international economic development and regional and local ethnic empowerment. The projects demonstrate continued restraints to indigenous resource co-management, in spite of some progress. Indigenous forest development was seen as a process. Some state and NGO advocates acknowledged to me that initially it might not be possible to create ideal arrangements. They celebrated the fact that a few Miskitu communities were beginning to manage their own forests, even though the model they were using was not indigenous. Meanwhile, indigenous land tenure remains unresolved and created conflict in each case.

The RAAN may not be conducive to forest management until land tenure is clarified. Although some aspects of communal governance were strengthened through village partnerships with the WWF, other constraints, such as insecure tenure leading to conflict between villages and with colonists, still threatened the project in 2005 after years of investment and effort. WWF representatives attempted to be apolitical and hoped that by carefully selecting project locations in initial stages, they would avoid debilitating conflicts. However, I think foreign groups that are going to intervene in the region need to help villages secure land tenure as a first priority, rather than merely avoiding conflict, because forest management is not likely until ownership is secure. Yet,

in providing financial support, outside groups need to be conscious of the fact that investment can sometimes aggravate conflicts and that if their knowledge of the area is based on rapid assessments or information from local elites, they are not likely to have a solid understanding of the situation. In such cases, outside intervention could create as many problems as solutions.

Sustainable forest management in the RAAN has only been developing over the past decade. The World Bank, USAID, WWF, and other global actors have moved away from conservation and towards “participatory” and “sustainable” extraction and use, as demonstrated by their project proposals for eastern Nicaragua. State institutions are slowly moving from coercion-based management policies to providing market-based motivations. These transitions fit with international trends. I argue, however, that social and cultural issues are not sufficiently addressed in these commerce-based projects, as evident in my research findings from Nicaragua.

CONCLUSION

Transnational Projects, Resource Use, and Decision Making

My research demonstrates that multi-scale analysis of case studies is necessary to understand forest policy change in developing countries. While an interesting story can be told about local, regional, national, or international activities, it is not possible to analyze development in Prinzapolka without examining complex motives and interrelated actions at various levels. Many of the case studies I covered were struggling to meet their own objectives during my fieldwork. To determine where they were coming up short, it is necessary to define the impact of international power imbalances, as well as national and subnational conflicts. Current development failures in the RAAN often appear to extend from past foreign and central government intervention. Scalar and network analysis demonstrate a series of inequities, many with historical roots, which continue to deter regional decision making and indigenous authority within forest management cases.

In addition to scalar and network processes, I have identified two independent variables that consistently emerged with each case study and constrain indigenous agency. These factors are the insecurity of land tenure and limited integration of indigenous institutions and representatives into forest policy decisions and project governance. Although indigenous involvement was better in some cases, like Limi-Nawâh, than others, such as the ABC and the Úbeda Brothers, all ten case studies have considerable room for improvement. Land tenure was not formally demarcated within any project and the titling process advanced little if at all during fieldwork, in spite of the urgent need to protect indigenous resources from increasing appropriation by other actors.

My research demonstrates that governance scale is not pre-given and that institutional flux is common. I show this with transitions among state administrative units and evolving forest development projects. Nicaraguan state scales are not permanently fixed areas. The Autonomous Region was created in 1987 and governance territories and rights at the regional scale are still being negotiated in 2005. Prinzapolka's boundaries are porous and contested. Formal townships shift with legislative reforms and informal indigenous territories expand and shrink as leaders stress different historical processes and events.

All ten case studies in my research involved vertical and horizontal scale shifts, as well as demonstrate the relevance of both scalar and network perspectives. While hierarchies continue in Nicaragua, project relationships also exhibit complex, polycentric network configurations. Network methodologies demonstrate flow, connection, and unboundedness. They convey the messiness of human-environment interactions. Networks collapse dualisms, such as nature and society, global and local, and non-state and state. Meanwhile, scalar methodologies help to identify hierarchies of power and internally differentiate horizontal or vertical processes within networks. Transnational development in Nicaragua seems to fit Brenner's (2001: 606) conceptualization of "a mosaic of unevenly superimposed and densely interlayered scalar geometries."

In addition to examining the structures themselves, my analysis highlights processes, such as decision making and agency, which contribute to fluctuation or fixity within and among scales and network. Mechanisms of domination, such as conditional lending, are evident throughout this work. Nevertheless, there are numerous examples of downward scale shifts and expressions of indigenous authority as well.

The socio-political, economic, and environmental processes exhibited in my case studies are frequently lumped under “globalization,” but this term does not satisfactorily reflect transitions occurring at multiple scales. It overemphasizes the global and underemphasizes national and sub-national scales. I show varying degrees of autonomy and power at several intermediate and small scales in Nicaragua, which has both practical and theoretical implications.

The Nicaraguan case studies suggest both similarities and differences from the historical context presented in Chapter Three. The Somoza family established and maintained complex partnerships with national elite and international companies, which could be depicted as a networks. INFONAC involved various international actors, such as development consultants and donors. Sandinista forest development was also linked internationally. State and business sectors were the most powerful in the national arena in both periods. Initiatives were centralized, although some municipal and regional decentralization did occur later under the Sandinistas. Indigenous decision making was limited, except in rebellion against the state, until late in the Sandinista administration when the power of Miskitu populations in natural resource decision making grew because of autonomy negotiations and approval. During this process, power was leveraged from below and conceded from above. While contested in some sectors and scales, decentralization has continued since Sandinista reforms, although there were periodic processes of re-centralization, especially during the Alemán administration.

Chapter Two demonstrates important changes in environmental aid in recent years. Trends include increased co-management, co-financing, non-state institutions, market-oriented policies, and development planning initiatives at large spatial scales.

Nevertheless, some aspects of international aid have changed little in the past decades. Millions of dollars were spent for forest sector projects under PROFOR, and yet INAFOR had insufficient resources to monitor extraction. During the middle of the last century, the donor-sponsored Northeast Forestry Project received vast support for pine management while there was an overall lack of funding for the forest sector. In former periods, external agents did not recognize local tenure regimes, which created conflict with indigenous populations. This problem continued during fieldwork.

Although non-state forest actors increased in Nicaragua in recent years, there was also greater momentum to bring different levels and sectors of the state into planning and management. PROFOR integrated central and sub-national structures, various state ministries, NGOs, companies, and village representatives. The RAAN Forestry Consultative Committee, hosted by the regional government, involved different state ministries, municipal representatives, NGOs, universities, and businesses. In these cases, the state was increasingly involved in the forest sector, but it was organized within a broader coalition. Both institutions received international support; it is possible that neither program would have existed without foreign aid.

STAGES OF ORGANIZATIONAL PENETRATION

I analyzed three stages of organizational penetration in core case studies in Chapter Six: conceptualization, negotiation, and implementation. These stages highlight sets of processes within transnational development. During conceptualization, there was formation of institutions that would later become important, such as the RAAN government, BICU, MLTC, GEF, and the ABC. Some emerged in relation to the proposed project, but most initiated independently. A few additional institutions formed

during the project negotiation stage, such as Contigo International and the genetic reserve and seed bank enterprise. Limi-Nawâh was created during early project implementation. Throughout conceptualization and negotiation stages, new institutions continued to congeal at multiple scales.

Project proposals come from a range of scales and sectors, although they seldom originate from local actors. In two of the three cases, project plans initiated outside of the country. Limi-Nawâh's initiation was strongly influenced by individuals. David Maldonado initially suggested the project to the chief of MLTC, and the chief advocated for the project within the council, which later proposed the project to the Canadian International Development Agency (CIDA). CIDA negotiated with the Nicaraguan state. Negotiations failed with the Alemán administration, but the project was welcomed under Bolaños, which confirms the importance of national level players.

U.S. conservation organizations originally promoted the Paseo Pantera corridor in the early 1990s. Central American heads of state took up the proposal in the mid-1990s. They were influenced by global actors, such as the World Bank and United Nations agencies, while writing Tropical Forestry Action Plans and National Environmental Action Plans. It was the Chamorro government that participated in these processes and negotiations surrounding the Earth Summit in 1992. The Global Environmental Facility negotiated the ABC at the beginning of the Alemán administration. The new president eagerly signed the multi-million dollar project proposal and even quickly drafted a land demarcation law for indigenous areas to demonstrate his willingness to cooperate with donor requests. However, in contrast to Chamorro, who had the reputation for being submissive with transnational institutions, Alemán increasingly perceived U.S.

involvement in Nicaragua as unwarranted outside intervention. Conflict with international donors developed during Alemán's administration, especially when corruption accusations against the president and other high officials surfaced.

The Bolaños administration changed the direction of the ABC. Once approved through bureaucratic channels, ABC implementation did not proceed according to plan. Hurricane Mitch created the first delays. The Alemán administration did not approve policy that was conditional for the release of funding. Alemán's draft land titling law was hotly disputed in the RAAN and RAAS because Caribbean populations had not been allowed to participate in its creation. Regional groups later put forth their own proposal. An indigenous land titling bill did not pass in the National Assembly until after Alemán left power. When Bolaños entered office in 2002, the regional ABC structure was poor. His government began project decentralization in early 2003.

One case study project was sponsored domestically. A RAAN official proposed the seed bank and lobbied central government institutions for inclusion in PROFOR. Negotiation between project scales and sectors occurred throughout 2002 and 2003. Local actors at the municipal and village levels were the last to be brought into the negotiations and, during my fieldwork, remained the most peripheral. Implementation of this case did not occur in 2003 as planned. Regional leaders of the project pointed out that the establishment of collective businesses appeared more difficult than private firms.

Some projects never get past conceptualization and negotiation stages. Three of my ten total case studies were either indefinitely or temporarily delayed at the end of research in 2003. EcoForestal was held up by major land conflicts and insufficient donor support. The genetic reserve and CEPISA experienced smaller setbacks and had not

begun implementation before the end of the funding cycle. Project leaders thus returned to negotiate with the central government and the World Bank.

Projects in developing countries often experience delays for political, economic, or even climatic reasons (e.g., heavy rains, floods, and other natural disasters, etc.). Limi-Nawâh and the genetic reserve project both waited for the definition of the boundaries and conservation norms for the Alamikangban Forest Reserve, which was created in 1991, but had never been demarcated or actively managed. The ABC was set back because the Alemán administration did not meet conditions for lending, including the indigenous land titling law. There was a delay for CEPISA to ship sawmill machinery to Las Crucetas because of seasonal rains.

Miskitu populations in Alamikangban and surrounding villages were impatient with the slowness of large-scale projects in 2002 and 2003. Local populations only knew what they saw and heard when representatives visited the area. One elder complained to me jokingly, “Some promise boat launches, others cattle, money, or jobs. We say yes because we can’t say no, but we don’t even know who they are.”²⁸¹ The rest of the time, supposition filled in for information. Local elites spread rumors about one another and different projects as they competed for new positions of power.

Distrust built from poor experiences with past state and NGO development projects. Project timing may need to be understood in relation to other initiatives. There were interventions in Prinzapolka villages prior to the onset of the projects under review, although they did not focus on forests. There may have been limited participation in forest initiatives on the part of some community members in 2002 due to apathy and

²⁸¹ Pers. comm., English, 02/19/03.

cynicism. A community member told me that whenever outside groups call a meeting, he no longer attends because he knows that they are just going to fill their book with names. Villagers often charged that NGOs and aid agencies do not create tangible improvements. Yet, it is notable that this community member, who claimed not to attend meetings, came to the public consultation that I called in his village. Showing enthusiasm for participatory processes, as much as eighty percent of adults in member villages voted in the elections for Limi-Nawâh council representatives in 2003. These examples suggest that if cynicism and apathy exist, they may potentially be reversed.

Projects are negotiated at various scales. Expenses must be justified at the national level, as well as to international stakeholders. Projects in eastern Nicaragua may involve regional and municipal governments. Projects extracting communal forest resources legally require signatures of village, municipal, and regional leaders. Prinzapolka went from having a low institutional presence to being crisscrossed with mandates at multiple governance scales. In some areas, institutions were denser than others. For example, Alamikangban is more heavily linked when compared with villages in the far west or east of the municipality.

Scaling up and down were frequent processes in the case studies. With the genetic reserve project negotiation, regional officials first scaled up to approach national and international institutions and then scaled down to work with villagers. In CEPISA, project leaders negotiated a scaled up management plan with land from four communities, but leadership was monopolized by one village and one family. Native-owned firms, like those under MLTC, are increasingly becoming transnational. Under the tribal council model, Canadian tribes demonstrated success as a result of scaling up. MLTC then scaled

outward to partner with other indigenous groups. There was also scaling down in terms of the Canadian foreign aid branch of government forming a partnership with the villages along the Prinzapolka and Bambana Rivers. Limi-Nawâh villages scaled up to establish a multi-village board of directors to govern a common area. Limi-Nawâh was the only case study to work in a village bloc formation. The implementation of multi-village blocs fits local cultural patterns, although the blocs promoted under Limi-Nawâh did not match existing blocs.

A key process in each stage of Nicaraguan projects appeared to be institutional (re)definition and flux. As examples, the boundaries of Limi-Nawâh and the ABC were not firmly established. The ABC proposal itself stated that the object of the corridor was not to be able to define lines on a map (GEF 1997). Limi-Nawâh's scales were not fixed. In 2004, the organization added coastal villages to facilitate access to the sea, since lumber transportation will occur by water. The member villages in Limi-Nawâh claim vast areas of communal land, but most do not hold titles. The area that Limi-Nawâh can claim is directly proportional to the area granted each village. The indigenous land demarcation process that Nicaragua is embarking on, with the help of international donors, will greatly determine where the Limi-Nawâh can log. It is in the shared interest of village members and their Canadian investment partners to assure indigenous control over forest lands. It is likely that a portion of profit from extraction will be used to lobby for the titling of vast communal areas. Alliances with international groups could provide an important advantage in terms of legal defense if the land tenure case against EcoForestal were to progress to higher courts.

The use of stages in describing organizational penetration brings in the importance of time as a factor, which has often been overlooked in the analysis of development projects. In the case of the ABC, the appraisal in indigenous villages that occurred in Prinzapolka during late implementation could have occurred during conceptualization or negotiation. Local populations could not influence the definition of the ABC project because it was more than half over by the time they became involved in planning exercises. While long-term aid risks create dependency, forest management and institutional development are lengthy processes that do not fit within short-term funding cycles. For project implementation, new administrative and technical skills were required from national to local scales within Nicaragua.

DECISION MAKING POWER IN THE CASE STUDIES

My findings agree with Swyngedouw (1997a, 1997b) that powerful agents are able to work at multiple scales, but they additionally suggest that powerful agents face constraints working at the village level. Although the case studies demonstrate that shifts in scale are common, it has been difficult for village institutions to scale up and for international institutions to scale down. While global institutions are able to couple with state institutions, this did not necessarily mean that they could network effectively at the local level. While not contradicting the ability of international financial institutions to formulate policy and drive development, this suggests that they are not as powerful as Swyngedouw notes. Given the emphasis on the village scale and local participation in sustainable development rhetoric, transnational actors had difficulties functioning at smaller scales and controlling development processes in eastern Nicaragua, at least during initial stages of projects. Whether delayed by rain, tenure disputes, or legislative

reforms, even the largest and most powerful international finance institutions were not omnipotent. It would need to be verified in the future if initial challenges can be overcome in later project stages, but the evidence from my research suggests that global actors will continue to be constrained by local realities.

Global actors were, however, able to promote resource marketing in each case study. *Commercial lumber would be the core product produced in half of the case studies*, if they were able to get off the ground. The MLTC and Limi-Nawâh cases demonstrate integrated social and economic development spurred by Canadian government investment in indigenous entrepreneurship. Their experience fits with an international trend towards community enterprises, also shown in the seed bank, CEPISA, and the WWF project in Layasiksa. Even projects that did not focus around the creation of firms included marketing. The market link is least clear in the ABC; nevertheless, the project's community development plans for Alamikangban included ecotourism, community businesses, and ranching. While there is both impassioned defense of neoliberal models and fierce criticism, the main problem with the criticisms is that they generally do not provide viable alternatives.

The case studies varied in the use of conditional lending. Donor funds for the ABC had specific policy requirements attached. PRADA's certification pre-conditions had to be addressed before SmartWood approval. Certification conditions for both PRADA and the Úbeda Brothers' Company also required change after certification. If these companies do not meet specified conditions at the next assessment, certification can be revoked. Likewise, funding can be cancelled if projects do not continuously meet

donor guidelines. The World Bank's grants through PRODEP were strictly regulated, as the leaders of the genetic reserve discussed.

Donors encouraged changes in ecological and social practices even if they were not linked to strict conditions. The topic of fire control in Alamikangban deserves further attention. Villager participation in the genetic reserve workshop nearly doubled the state-invited number, demonstrating substantial interest. However, I interpret that village interest was focused around the creation of the community enterprise and potential leadership selection and less around the concern over the annual burning of the pine plains, which was the focus of the workshop. Nevertheless, several months before this workshop, my household surveys recorded that eighty percent of the participants thought that the plains should never be burned. In administering the surveys, I remember many people adamantly reiterated this response. There could have been several processes at play, however. First, my position as an outsider interested in forest issues may have prejudiced people's responses. Second, the work of previous development NGOs in the region could have had a role.²⁸² Interestingly, on the survey question referring to the responsibility for reforestation, more people thought that an NGO or aid organization should reforest than those choosing firms, the state, or community members. This response suggests that environmental NGOs may have influenced people.

The development projects I studied influenced village institutions. All of the projects granted power to some local segments of society, while restricting others.

²⁸² There may also have been some influence from state anti-burning campaigns. Donor support for state fire control programs in Central America increased in the late 1990s after high levels of forest fires. However, Córdón (2001) presents a detailed study in Miskitu villages in the north of the RAAN documenting why people continue to burn and still utilize the same methods to burn after decades of state programs trying to change these factors.

Contigo International upheld gender quotas for workshops and field activities. Limi-Nawâh challenged sindiko and communal leadership structures. MLTC's democratic multi-village council with tightly regulated elections is a vastly different governance model than Miskitu communal institutions. Some other projects reinforced or expanded sindiko roles.

Table 13 demonstrates the relative decision making power among the various scales in the core and supplementary case studies. Power was estimated from interviews, secondary sources, and observation of meetings between groups in Alamikangban, Bilwi, and Managua. Scales without color were absent from decision making in 2002 and 2003. Hierarchies are evident in color progressions from dark colors at higher scales to lighter colors in lower scales.

Governance scales in Table 13 can be further broken down into business, NGO, civilian, and state sectors. Development processes seldom involve only one sector. Even the Forest Stewardship Council, which is touted as a non-state rule-making institution, has some state funding.

In Table 13, I depict the international scale as one level, but there is a gradient evident in case examples. Organization at the level of the Central American region was important in the ABC and WWF/Layasiksa cases, but this supra-national regional scale was not involved in the other efforts.

TABLE 13

Decision Making Power in the Case Studies, 2002-2003

	Governance Scales					
Case Study	Village	Bloc	Municipal	Regional	National	International
ABC						
CEPISA						
CITES						
EcoForestal						
Genetic Reserve						
PRADA						
WWF/Layasiksa						
Limi-Nawâh						
REPMAB						
Úbeda Brothers						

 = Weak
  = Intermediate
  = Strong
  = Very Strong

There was considerable overlap and interplay among levels depicted in Table 13. As one example, the MBC included the ABC, which funded the central government to work with the RAAN government to assist several municipalities. In Prinzapolka, ABC project representatives sponsored development proposals for nine villages.

Transnational Development Network Geographies

Case study differences comprise the structure of networks, including the numbers and strengths of different scales, the number of horizontal linkages, and the combinations of sectors (e.g., donors, state, nongovernmental, indigenous peoples), the combination of core goals, the spatial size, and whether the project had a direct physical presence in the municipality, such as an office, sawmill, or a contracted forest management unit. Some did not have a local presence in 2003 because they were not yet at this stage of implementation. Policy networks, such as CITES, that were not physically present in the study area, may cause future material changes in local forest use, but in 2003 these impacts were not yet apparent (see Table 14).

There were horizontal shifts in political organization in each of my ten Nicaraguan case studies, whether between indigenous villages, municipalities, states firms corporations, or environmental organizations. One or more outward linkages occurred in each of the projects. More than half of the projects had greater than five horizontal linkages. Complex transnational networks like the Forest Stewardship Council or CITES contain hundreds of outward links. Yet, polycentrism as noted in Table 14 does not necessarily signify equally shared power. Six of the ten organizations were polycentric internationally, but either hierarchical or centralized within Nicaragua.

TABLE 14

Case Study Interactions, Scales, and Networks, 2003

Case Study	Horizontal Linkages (#)	Multi-scale Structure	Degree of Hierarchy	Core Goals	Spatial Size and Presence	Partners
ABC	>5	polycentric (I), hierarchical (NSN), communal (V)	high	social, ecological	large	donors, multi-level state, NGOs, indigenous villages
CEPISA	2	polycentric (I), hierarchical (NSN), exclusive (V)	medium	indigenous entrepreneurship	medium*	donors, multi-level state, NGOs, collective firm, indigenous villages
CITES	>5	polycentric (I), centralized (NSN), non existent (V)	low	ecological	large	donors, states, NGOs, scientists
EcoForestal	1	polycentric (I), non existent (NSN, V)	high	business, social, ecological	medium	donors, private firms
Genetic Reserve	2	polycentric (I), hierarchical (NSN), communal (V)	high	indigenous entrepreneurship, social, ecological	small*	donors, devolved state, NGOs, indigenous villages
PRADA	>5	polycentric (I), centralized (N), non existent (V)	medium	business	small*	FSC, SmartWood, private firms
Layasiksa/ WWF	1	polycentric (I), decentralized (NSN), communal (V)	medium	indigenous entrepreneurship, social, ecological	small*	donors, NGOs, collective firm, indigenous villages
Limi-Nawâh	>5	polycentric (I, VB, V) communal (I, VB, V)	medium	indigenous entrepreneurship and self-governance, social, ecological	medium*	donors, collective firm, multi-village blocs and councils, indigenous villages
REPMAB	>5	polycentric (I), polycentric (NSN), communal (V)	low	business, social, ecological	medium	donors, multi-level state, NGOs, firms, indigenous villages, forest professionals
Úbeda Brothers	>5	polycentric (I), centralized (NSN), non existent (V)	medium	business	small*	FSC, SCS, private firms

* = direct physical presence within Prinzapolka municipality
 I = international
 NSN = national and sub-national

VB = village bloc
 V = village

Some case studies spanned space without covering it. Examples are the Forest Stewardship Council and CITES, which are both long-distance thematic networks, and the MBC, which did have intense coverage in some areas, particularly in priority protected areas. Additional research would be necessary to determine how the ABC's implementation process compared with other countries and evaluate the MBC at the scale of the Central American isthmus. Given the lack of ABC results in Prinzapolka, a project evaluation at village or municipal scales would be poor. The results at the regional level were more positive as the community plans and planning experience are likely to serve future development. Thirteen RAAN villages outside of Prinzapolka initiated development projects. National level gains were also positive as jobs and materials entered Managua. Oversight of the ABC spurred institutional and technical development in several state offices, in particular, the environmental ministry. State, university, and NGO professionals involved in land use planning were trained in mapping and rapid appraisal techniques.

Due to its large scale, the MBC has little precedent. It appears necessary to have additional institutional scales to fit multiple ecological scales within the corridor. The ABC's large spatial size appears to have influenced decision making structures during implementation – village participation was limited because there were so many areas to cover. The ABC was designed to be large enough to protect ecosystems at a bioregional scale, but coverage, even during its final year of implementation, was patchy and fragmented nonetheless. Not all existing protected areas were included as nuclei conservation zones. The development plans proposed may have benefits for some villages, yet they may not directly assist in the protection of viable biological corridors

across the RAAN. Only a portion of indigenous villages in the RAAN were chosen. Areas considered in ABC documents to have high ecological value and risk for deforestation were numerous and, in some cases, political factors appear to have weighed heavily in the inclusion of certain villages or areas above others.

Brosius and Russell (2003) suggest that large-scale projects are often technocratic and authoritarian. The CITES and ABC were spatially largest of the case studies evaluated. With only one office, which was located in the capital city of Managua, the CITES structure was entirely centralized within Nicaragua. This contrasts with the transnational CITES structure, which is highly decentralized. The ABC project proposal stated that participation was a goal and village input was greater than in many state and NGO programs in the past. ABC administrators were proud that community development plans were given back to villages so that they would feel like they owned them. However, rapid appraisal methods were used and local input was concentrated and brief.

The ABC targeted indigenous development, but funding was distributed through the central government, which granted a large degree of state control over autonomous, self-governing, indigenous populations. Regional and national officials argued in 2003 that the decentralization of the RAAN portion of the ABC was important and felt that the project results improved after administrative transfer to Bilwi. My findings suggest that the assumption that larger is more efficient or effective is not always the case in terms of institutions. If large-scale ecological or conservation landscapes are found to be essential to promote conservation, this will be a problem. The role of institutions may limit or redefine politically possible conservation scales.

Institutional-ecological Scale Discordance

I identify four types of institutional-ecological scale discordance in my case studies that appear common in multi-scaled resource management projects: horizontal scale disjuncture, vertical scale disjuncture, spatial disjuncture, and temporal disjuncture. The first two types occur between institutions – horizontal scale disjuncture is predominately due to competition between groups at the same scale, and vertical scale disjuncture is predominately due to power differentials between scales. The second two types of disjuncture occur between ecosystems and institutions. Spatial disjuncture occurs when areal coverage of institutions does not match ecosystem boundaries or the spatial distribution of ecological processes. Temporal disjunctures involve time scale differences between institutions and the resources they are managing.

In several cases, there are power differentials between project levels, with higher scale having more financial and human resources than those below. The genetic reserve project clearly exhibited this vertical pattern. Just as national actors constrained RAAN decision making, regional structures limited village roles. There were occasions when village representation was subordinated to the technical expertise of BICU and the RAAN government. While village leaders may have been more forceful in demanding power, the case shows political dominance of the regional capital over a remote village.

Horizontal disjuncture was demonstrated in the case of CEPISA, whereby one village dominated others. Ethnic differences appeared to play a role in some horizontal disjunctures. La Palmera was included in ABC plans and, as such, was the only mestizo village in Prinzapolka targeted for aid under these case studies. Although REFROMAB included mestizos from the Mining Triangle municipalities, non-indigenous populations

from Prinzapolka were not involved. There was also the potential for ethnic conflict between indigenous groups. While the Cree are dominant in population size and number of communities, MLTC nevertheless equally distributes profit among all membership villages. In theory, Miskitu and Sumu-Mayangna villages in Limi-Nawâh were agreeing to the same structure, but resource distribution had not yet occurred in Nicaragua.

Within Limi-Nawâh, many member villages were weary of managing the forest at a larger scale because they questioned equity between villages. There are some areas where it would be appropriate to design forest management plans and initiate extraction. Other forests should be allowed to rest or not cut at all. Proceeds from harvest in the first areas would be used to assure that logging does not occur in the second.

Limi-Nawâh is predominately a global-local partnership, which has led to vertical disjuncture since the RAAN has multiple layers of decentralized government. Unless sub-national institutions are brought in to assist project implementation, working with decentralized structures can seem like a burden as they require additional time and energy. As intermediary officials were not initially included, some appeared threatened by Limi-Nawâh and spoke out against the project in 2003 as a result.

In my research, there were intermediate-scale projects, such as Limi-Nawâh, CEPISA, and EcoForestal. Two factors suggest that Limi-Nawâh was not entirely matched to local ecosystems. First, political and social factors played a large role in project initiation in spite of the fact that Canadian organizers wanted ecological and technical aspects to be prominent. Additional forests that would have been ecologically appropriate, and would have helped the project to reach an economy of scale for exportation, were excluded because they belonged to a municipality in the RAAS. To

include another regional government, as well as another municipality, significantly increases political complexity. Second, Limi-Nawâh includes portions of two watersheds. To work in the entire watersheds, Limi-Nawâh would have had to partner with upriver mestizo populations that confiscated and privatized communal land. The Canadians were primarily interested in partnering with indigenous populations. Further, indigenous member villages may have been distrustful of the Canadians if they had initially included mestizos, who are often seen as opponents.

Comparison of the WWF project in Layasiksa and Limi-Nawâh is logical, given the proximity of the goals and methods of these community forestry enterprises. During fieldwork, these two initiatives were different in terms of scale and tactics. The philosophy of WWF was to teach forest conservation, planning, and management to village members. WWF was happy with their results during the 2003 harvesting season, even though Layasiksa did not sell lumber because community members had been trained and had improved their negotiation process with PRADA. WWF-Bilwi maintained a full-time forester for Layasiksa and Sangni Laya each. The ratio of staff to village in WWF was much lower than Limi-Nawâh. However, community forestry projects are only one aspect of WWF work in Nicaragua. The organization also provides technical assistance, environmental aid, and policy guidance.

Limi-Nawâh included too many villages to have high presence in each. A Canadian project organizer stated to me that he did not prioritize a WWF-type of village education at the start because he believed that they could talk until their faces were blue and were not likely to influence people's economic decision making, self-governance, or forest management practices. He believed that Limi-Nawâh's demonstrated profits would

effectively influence future sustainable forest use and that the equitable distribution of future project resources among villages would reinforce democratic governance in council elections when compared to past sindiko corruption. MLTC and Contigo representatives were interested in improving forest management like WWF, but they were also focused on issues of indigenous self-determination and provision of social services. Limi-Nawâh programs were going to be much broader than just forest development. For marketing, social programming, and forest management, project organizers felt working at a large scale was important. They believed that smaller scale village projects like WWF could only manage the forest for the trees and not for the people.

The boundaries of the small genetic reserve were chosen in part to avoid tenure conflict. Prior claims by Robert Merrick and other investors in EcoForestal determined the reserve boundary on one side. On another side, the best pine forests were held in a private logging concession with Hernandez. Other nearby communal areas with high quality seeds were being used for cattle ranching by a wealthy villager, who deterred others' access with threats and guns. Although more studies are needed on the ecological viability of conserving and managing the remaining pine stands for seed harvest, these conflicts could contribute to a spatial disjuncture between the ideal area for the project location and current boundary selection, which was influenced by institutional and political factors.

Conflicting Commodity Dreams

Although international, national, and sub-national actors, including local Miskitu populations, plan to sell forest commodities, each has a slightly different perception of

the notion. The scale of development that indigenous villages often envision to create jobs and bolster the local economy are very different than the multimillion dollar projects that have been approved. In Chapter Two, I noted Najam's (2002) related point that large-scale development institutions are generally disinterested in projects with little budgets, such as those in small-scale community projects working through existing local institutions. There are mismatched scales and institutional capacities within transnational development because of the prioritization of megaprojects, multiple layers or bureaucracy, and the dispersal of large quantities of money instead of attention to inexpensive, grassroots, and small-scale projects. The latter require less foreign involvement, contrary to the invasive intervention that is dominant today.

During fieldwork, the large projects had not yet realized national or international sales in the majority of case studies. National and subnational development and businesses proposals often remain a dream for Nicaraguans. For example, forest commodity production has been plagued for centuries by poor infrastructure, political conflicts, and harsh environmental conditions, such as heavy precipitation or natural disasters. There is little reason to suggest that eco-friendly commerce will be any different. Few national environmental service markets had emerged as of mid-2005. Certified forestry and other production projects advanced slowly and with mixed results.

It is not clear if the RAAN can host reliable, large-scale commodity production. Yet, in the few spurts of time when commodity dreams have been actualized in eastern Nicaragua, such as with big-leaf mahogany, they have lead to boom and bust economies. I find the trend to bolster commerce of natural resources concerning because production in Latin America often does not have basic environmental controls, while protection of

indigenous and workers' rights are also poor. If these projects are able to succeed economically, they may still be lacking social and environmental balance.

In spite of the limitations of linear depictions and my hesitancy to simplify fluid and complex realities into a fixed diagram, if production and processing are achieved in the future, a useful methodology of analysis would be the commodity chain. Commodity chains may assist in the determination of the macro-micro links between processes that are generally assumed to be discretely contained within global, national, and local units, thereby helping to demonstrate cross-scale interactions and influences. Yet, I did not utilize this methodology because the stages to add value to raw timber were minimal in most projects at the time of research, as were production levels. While conscious of potential limitations in diagramming, I plan to look for ways to integrate commodity chains into future project analysis when production has developed. I am also curious about links between commodity chains and aid chains, which I propose may further define the advantageous position of donor countries within transnational networks.

At the time of fieldwork, it was too soon to tell how the case studies would impact village communal land or tree use. The commonly used tree species listed in Appendix One may be altered. If trees are placed under a management plan, villagers no longer have access. The situations described in the paragraphs below demonstrate conflicts over commodities. I propose that tension may increase if commodity dreams become a reality. In contrast, project administrators believed that conflict would lessen when commodity proceeds reached communities. In my opinion, this is a naïve interpretation based on poor understanding of historical social and cultural conflicts and inequities.

In 2003, there were conflicts when local use was altered, restricted, or threatened. With the case of Las Crucetas, impacted villagers and communal leaders took a case to the Prinzapolka judge when the president of CEPISA ordered their lumber to be decommissioned because it was extracted from what he considered to be the company's forest concession. In another case, the pine forests near Alamikangban were hotly contested during 2003 because of the new Limi-Nawâh logging mill. This was a small, mobile mill and the lumber harvested was for the construction of Limi-Nawâh offices and meeting center. Although the level of production was much lower than it would be under commercial operations in the future, a small but vocal portion of Alamikangban was immediately critical of Limi-Nawâh's use of communal resources, in spite of the fact that the multi-village board had granted permission for the extraction. However, higher scale project managers predicted that concerns would vanish when proceeds from logging began to return to the villages.

At the time of fieldwork, individual villagers and Limi-Nawâh were harvesting in different areas of the pine plains, but there was overlap in some broadleaf forests. Without INAFOR permits, villagers were illegally cutting mahogany from areas that Limi-Nawâh was negotiating formal management plans. If intermediaries continue to purchase mahogany, the likelihood of conflict over the remaining trees is high. Many standing mahogany trees in the municipality are marked with someone initials. Under local codes of ethics, this means that this person has extraction rights. It is unclear what solution will be devised if these marked trees later fall within project management plans.

In 2003, Alamikangban villagers cut trees and burned within the area the genetic reserve. The plan was under state review and had not yet been approved, but the change

in forest composition could contradict the pending management plan and alter future commercial activities. Moreover, once the management plan was approved, village access to the zone would be restricted. These pine areas are the most accessible to people from Alamikangban and are frequently utilized for lumber extraction, hunting, gathering, and ranching. The extractive reserve proposal required the deforestation of the majority of the management plan area. The plan stated that the lumber produced as a result of isolating the genetic reserves would be distributed to village members or sold for the benefit of the village, although there were no details on the process. The maldistribution of communal resources was a constant problem during fieldwork.

Although village members were likely to agree to the genetic reserve's management plan because of the potential for work and income, I predict that some will later complain about the deforestation and the fact that they no longer have the forest for personal extraction and production activities. Additional pine areas located beyond the reserve are already restricted due to other private concessions and ranching.

Increased employment as a result of the development projects is likely to attract indigenous and non-indigenous migrants, each with their own set of commodity dreams. This is an historical pattern in the RAAN, and many of the villages along the Prinzapolka grew rapidly during periods of employment opportunities as a result of logging and mining ventures. These pull factors, combined with the push factors, drive the eastern movement of the agricultural frontier. Mestizo populations are quickly rising in the western and northern portions of the municipality, which have been heavily logged in recent years. Ninety-four percent of Alamikangban community members I surveyed believed that colonists living on communal land did not have the right to cut and sell

trees. Eighty percent of these Alamikangban households wanted to see colonists forced to leave.

Land tenure rights were becoming increasingly controversial at the end of my fieldwork as local populations began to understand the legal implications of the 2003 land titling law. Under this legislation, indigenous populations were granted the right to decide if mestizo colonists who had arrived since 1987 could stay on their land. I observed mestizo villagers emphasizing friendships with Miskitu during their periodic visits to Alamikangban. I interpreted these increasing public displays to be linked to concerns created by this provision. The titling law also stated that colonists would be compensated for buildings and other material improvements they had made on indigenous land if they were forced to leave, but it did not state where these funds would come from. The details of demarcation and titling were beginning to be discussed in the RAAN at the end of my fieldwork.

While researching land tenure disputes in the Prinzapolka courthouse, the high rates of violence among mestizo populations, especially young men, became apparent. People carried out their own forms of justice with pistols, rifles, machetes, knives, and fists. It appeared quite probable to me that if indigenous people began to force mestizos to leave homesteads that they had lived in for as long as two decades, the area would likely become violent. Disregarding the potential for violence, the state and donors had long planned to use indigenous peoples as a tool to promote biodiversity conservation along the agricultural frontier. According to the 1997 ABC proposal:

One key element of the [Government of Nicaragua's] strategy for the Atlantic is to minimize access to high biodiversity areas. One mechanism for achieving this is by strengthening and enforcing land and natural resource rights of indigenous communities (GEF 1997: 7).

Development Aid and the Politics of Scale

The forest is a social and political place (Peluso 1999). Although the general location of projects involving logging was influenced by ecological criteria, such as the densities of precious species, political factors strongly influenced many project boundaries. Important factors included ethnicity, economic need, land tenure conflict, and the jurisdiction of other projects, villages, and municipalities. Harvey (1993: 28) states:

It is fundamentally mistaken...to speak of the impact of society on the ecosystem as if these are two separate systems in interaction with each other. The typical manner of depicting the world in terms of a box called 'society' in interaction with a box 'labeled' environment not only makes little intuitive sense...but it also has just as little fundamental theoretical and historical justification.

Forest management areas are social spaces, along with ecological spaces, as they are socially conceived and preserved. Science may be used to justify and frame development issues and policies as a means to de-politicize matters, but there is still intense polarization. Neoliberal economics, parks and protected areas, certified forest concessions, indigenous self-determination, and numerous other topics treated in this work are contentious.

This work presents the complexity of forest development in indigenous communal areas. Widely conflicting opinions make defining best practices or a coherent solution to various challenges difficult. All the rhetoric about sustainable and participatory techniques draws attention away from injustices in the overall structure and the lack of will to make fundamental change or give up benefits at higher scales to advance the agendas at sub-national scales. A political ecology framework highlights positions of power and implications for indigenous and marginal populations. As one example, by identifying the transnational networks involved in particular projects, it is possible to see

that few institutions are independent. “Independent” studies and “outside” consultants are, in fact, often financed by the World Bank, WWF, or bilateral agencies. State studies often have similar sources of income. These more subtle linkages are important to understanding the domination of transnational development agendas on the part of an elite group of powerful and tightly networked institutions.

Development is a process that is constantly under revision, although it is rare that procedures or structures are radically revised. By 2000, there was increasing global recognition that uniform forest policy may not be equally appropriate for all national contexts (Seymour and Dubash 2000). One argument for decentralization is that policy can be sensitive to local environments and cultures. Yet, donors and policy makers working in Nicaragua continued to rely on the dominant macroeconomic and ecological prescriptions. Blueprint approaches use strategic planning to determine nature’s biodiversity and potential commercial value through centralized decision making guided by science and technology (Pimbert and Pretty 1997). Rules and methods are standardized and universal. Evaluation is external and intermittent, and any errors discovered are largely buried. Local stakeholders are seen as “beneficiaries” and their activities are tightly controlled. The ABC, especially during negotiation and early implementation, matched these attributes. As shown in Table 13 above, several other projects did not have decision making in sub-national levels, or the power at this scale was weak.

Pimbert and Pretty (1997) contrast the blueprint approach to a learning-process approach in which human diversity and natural values are both valued. In many ways, the learning-process approach they describe is similar to adaptive management within the

scientific community. Decision making is decentralized, processes are dynamic, and methods are diverse. Evaluation is internal and continuous. Error is embraced, rather than buried, and used to motivate further learning. Adaptive projects focus on empowerment, and impacted populations are described as actors, rather than beneficiaries. Although multi-scale development agencies often discuss this type of participatory aid approach, implementation is still limited. The Canadian government, MLTC, and Contigo International were moving in this direction with Limi-Nawâh. WWF-Central America and WWF-Bilwi and were also promoting several of these elements in their work with Layasiksa.

The WWF relationships just mentioned suggest that transnational networks or institutions are not homogenous at different scales or in diverse branches. There are strategic differences within the international WWF network, which has offices located in more than two dozen countries. Generalizations that are made about WWF-International or WWF-U.S. may not hold for the Central American branch, which has made significant progress in implementing projects in Miskitu villages in eastern Nicaragua. Based on disagreements, such as the increasing use of World Bank funds in the U.S. office in the 1990s, there were lawsuits between key WWF branches (Chapin 2004). Environmentalists have a range of opinions on different organizations. As one example, WWF has more than a million members in the U.S. alone, but other environmentalists are strongly critical of the organization. Such differences within the same network reinforce the need for nuanced development studies. Analysts need to be conscious of agency at multiple scales and acknowledge differences, rather than generalize for the sake of simplicity.

TWO INDEPENDENT VARIABLES

I have built a strong argument for the use of scalar and network methodologies, yet analysis of these ten case studies showed the importance of two additional independent variables that require attention in the context of the RAAN, and probably in most indigenous areas. Two important factors in each of the case studies, and generally in development projects in the RAAN, are security of land tenure and self-governance rights.

Although communal land tenure and governance are supposed to be protected in Nicaragua's constitution under the Autonomy Statute, they are not guaranteed in reality. While there has been advancement in the recognition of indigenous rights in recent national policy, such as the regulation of the Autonomy Statute, the implementation of legislation is poor. The 2003 indigenous land titling law granted power to decentralized institutions, such as the regional government, to demarcate land, but these entities lack the funds to carry out the process.

Indigenous Land Tenure

Tenure insecurity in Prinzapolka appears to require at least partial resolution at higher scales. Nonetheless, the behavior on the part of some leaders and elites suggests a degree of local control over resources and considerable power on the part of a few leaders or households. Evidence of agency on the part of individuals at multiple governance levels, including the village scale, has been stressed throughout my research. Nonetheless, national and international influences also remain forefront.

Many Prinzapolka case studies initiated in spite of the fact that indigenous communal land claims were without demarcation. While insecure land tenure was

addressed differently by each project, only that of Robert Merrick, which is currently disputed in RAAN courts, openly challenged indigenous claims to land and forest resources. Nonetheless, the market-oriented solutions proposed by these projects have not resolved the problem of insecure land tenure and, in some instances, particularly in the cases of EcoForestal and CEPISA, have increased conflict over resources.

Continued tenure conflict may impede, or at least complicate, integral forest management in some cases in Prinzapolka. Development projects may increase inequities because elite individuals with access to political and economic capital may use opportunities to their advantage. In other cases, forest concessions have stagnated because of conflict over land, as has occurred with corporate extraction in the village of Tungla, where the family who holds the communal title refused to cooperate on a forest plan. Unclear ownership can also impact actors at higher scales. I spoke with international donors and consultants about the court case between indigenous villages and the international company led by Robert Merrick. They acknowledged that, depending on the finding of the courts, they could potentially lose their investment.

Commodity sales within certified areas appeared to have the least indigenous control among the case studies. In case of the Úbeda Brothers, communal land rights were not recognized. With PRADA, the company's concession on communal land was certified, while Layasiksa did not yet have approval for their own certification of process in their own concession. At the time of writing, Layasiksa's certification was threatened because neighboring villages had illegally harvested from the area that was being prepared for evaluation. Insecurity of communal tenure, and the inability to enforce

extraction rules, was therefore an impediment to certification, regardless of WWF's assistance.

While SmartWood's certification office is located in Mexico, and the PRADA certifiers were Latin American, local tenure rights were not given any greater attention than in the SCS certification of the Úboda Brothers, when the certifying office was located in the U.S. This is consistent with the fact that FSC rules, evaluation, and monitoring should be the same in both cases - and throughout the globe. Yet, I suggest that FSC standards and procedures are not sufficient to evaluate complex land conflicts in the RAAN. Naturally, the lack of domestic certification standards in Nicaragua at this point in time may have contributed to this oversight. Nonetheless, since national certification standards were later created in Managua, I do not believe that they will adequately address RAAN institutions and settings either, like much of Nicaraguan policy. *Such policy constraints reinforce the need for additional autonomous region representation in international and national decision making in addition to the actualization of self-governance within the Autonomous Region.*

An immediate priority for the Limi-Nawâh case study was the economic demarcation of communal land. While titling would be ideal, project organizers realized that this would not occur immediately in eastern Nicaragua. "Economic demarcation," such as the creation of forest "concessions," would promote investment security, as well as assure that outsiders do not illegally extract lumber or burn agricultural fields on indigenous lands. Nevertheless, land titles are still essential because commercial and private projects wax and wane. Also, state and project administration will change hands, which may lead to the reversal of past policies. Although some indigenous populations

reject the government's right to decide their communal land boundaries, the main method currently to assure tenure security, and thus reinforce local decision making with regard to resource use, is through formal state titling.

With the expansion of internal migration and increasing entrance of national and transnational firms to the region, if indigenous land is not defined and titled immediately, there will be little remaining in a decade. Under technical planning, the future "developed" RAAN appears to consist of sporadic indigenous reserves and biodiverse hotspots surrounded by cattle ranches, forest concessions, agroforestry plantations, industry, and resorts. Whether they accept state and donor plans or not, indigenous peoples need authority to create their own development visions. The first step is defining land rights.

Land tenure is essentially a local issue, but for village rights to be respected under current Nicaraguan law, support is required from actors at higher scales. This is one example of many in my research demonstrating the interpenetration of processes at various levels. A similar cross-scale approach is necessary to advance Miskitu self-governance. Opportunities need to be created, and constraints lifted, at a variety of scales, but local populations must also take better advantage of these openings. Clearly, village institutions need to become stronger so that benefits from communal enterprises will be more equitable.

Indigenous Self-governance

Donors most often support indigenous development by funding states and other external institutions instead of supporting local populations directly. In addition to state agencies, NGOs and consultants are given salaries to assist villages, but there are often

few funds given directly to indigenous populations to develop and run their own institutions. This is often argued to be a temporary situation, but the question remains if power will ever be handed directly over to indigenous populations, which has rarely occurred in development projects around the globe. MLTC is an exception. However, although distribution to First Nation members did improve, the roles that the organization has assumed are very similar to the private logging companies and public social service agencies prior. *Indigenous organizations in eastern Nicaragua seem to receive funding when they mirror firms or state institutions, or they become NGOs or political parties. What about if they remain communal?* In the midst of the development aid boom in the RAAN, I can think of only one communal institution with foreign funding - an agriculture project in Waspam Municipality.

The partnership between MLTC and Limi-Nawâh demonstrates important changes in indigenous economies in recent years. *It is a sign of increased equity when an indigenous corporation has the surplus income to invest in foreign development.* MLTC is an example of an indigenous-state partnership that has been largely positive for both groups. Limi-Nawâh grants less power to the state and more to corporations and NGOs, but at the same time there was crucial state investment from CIDA. As these supposedly temporary support structures phase out, it will be possible to better evaluate issues of indigenous self-governance.

In spite of a preference for self-governance, as discussed in Chapter Five, Miskitu institutions are often currently weak. Miskitu in Alamikangban employed limited norms to stem over-extraction. During fieldwork, forest governance was close to “communal open access,” meaning unlimited and unregulated use for community members. Some

local elites were ignoring the few rules that existed. There was not a strict limit on common-pool resource use per family, but it was generally expected that households would claim a reasonably sized parcel of land or quantity of resources for their subsistence and commercial production needs (e.g., less than ten hectares, less than twenty trees). During fieldwork, one wealthy Alamikangban cattle rancher had claimed kilometers of forest as his own personal plot and was privately selling trees to lumber intermediaries along with grazing cattle. Although some community members openly complained about this individual during my time in Alamikangban, no one was willing to challenge his claim. Can a multi-scale structure instigated by foreign donors help local institutions to create and enforce equitable rules-in-use and ensure sustainable practices? Or, alternatively, will local groups be able to scale up to establish and monitor rules?

The literature suggests that scaling up through the formation of federations and networks may keep governance decentralized, while attending to problems that cover multiple villages or various governance scales. If coordinated by blocs or districts, small-scale enterprises may meet economies of scale for planning, management, marketing, monitoring, or control. There is often bias against small operations due to diseconomies of scale, but effective networking could address this constraint.

Analysis of ten case studies demonstrates continued limitations to indigenous self-governance. At the same time, actors at larger scales reinforced the power of locally-elected representatives to make some decisions about communal land. Table 15 demonstrates a degree of self-governance in six out of the ten cases. Four cases involved the creation of a specific local institution, such as a project board of directors.

TABLE 15

Communal Land Decision Making Authority, 2003

Case Study	Primary Decision Making Authority	Process Granting Authority
ABC	Leaders selected for participatory diagnostic (e.g., elders, sindikos, pastors, and teachers)	Mixed; some elected.
CEPISA	Administration and board of directors of collective firm	Election by assembly in Las Crucetas
Genetic Reserve	Administration and board of directors of collective firm	Election by assembly in Alamikangban
Layasiksa/WWF	Administration and board of directors of collective firm; sindiko	Election by adult populations in Layasiksa
Limi-Nawâh	President, vice-president, board of directors, multi-village council, commission leaders, commissions	Election by adult populations in member villages
REFROMAB	Network includes a portion of village sindikos and other leaders (e.g., not invited from every village, some chose not to attend assemblies)	Mixed; some elected

Elections are occurring in Prinzapolka, as shown in Appendix Five, and creating common-pool institutions. These distinct institutions cooperated little in 2003. Table 15 appears to demonstrate some diffusion of power as a result of projects, although *sindikos* were active in various capacities and still held exclusive right to authorize forest extraction outside of projects.²⁸³

The state and private corporations are often able to benefit from institutional chaos in the RAAN. Indigenous representatives are given largely token roles in projects, meaning that external organizations are able to maintain control. The Nicaraguan state has a lot to lose if well-organized autonomous structures are created. There is a sizable contingency in the RAAN, largely within the Miskitu population, but not exclusively, that believes that the state has no authority to demarcate land or define resource use in the region, and that it deserves little or none of the proceeds. Many elders and civil war ex-combatants hold this view. If institutions at this level are able to network more effectively with communal authorities, the RAAN government could represent a scaling up of indigenous and ethnic villages to a size that could threaten the central government's power over the region. Approximately fifty percent of Nicaragua is contained within the Autonomous Region. If the economy gets significantly developed through regional institutions, the autonomous government may decide to secede altogether, which would mean both the loss of natural resource revenue and the transfer of development resources. Regional projects that are now administered through the central government help to fund salaries and offices in Managua, as seen with the case of the ABC.

²⁸³ There was no elected village authority in Ecoforestal. Two *sindikos* reinforced the foreigners' land rights. Some *sindikos* and elders later mobilized against the project, while other leaders supported it.

Radical organizations that challenge the economic or political status quo do exist in the RAAN, but I have observed that they are less likely to receive foreign or national support than groups that are largely apolitical and adopt non-indigenous structures and policies. While greater research would be necessary to quantify trends, this type of observation suggests the need for more attention to indigenous rights and governance structures under development finance and policy. Donor reports always make it appear like foreign institutions are financing legitimate local institutions, but in my opinion, this is based on superficial understanding of the existing alternatives, or information that has been filtered through the central government. I suggest that collusion between state actors may occur. For example, as long as the Nicaraguan state follows economic prescriptions, bi- and multi-lateral donor institutions may not insist on larger political or social transformation, assuming current conditions do not undermine the expansion of neoliberalism. Control over export economies in the Caribbean region is important to Nicaragua's balance of payment and, thus, is granted greater importance than the clarification of indigenous land. Moreover, Miskitu resource claims may conflict with private and state concessions. The formalization of indigenous rights could require redistribution in the profit structure from forest extraction, with gains shifting from the higher to lower scales and from private to communal enterprises.

A core conclusion is that there has been insufficient attention to cultural groups, local institutions, and ecological factors in the case studies under analysis. This is characteristic of neoliberal development, which is most often advanced through economic institutions that formulate programs based on financial principles and criteria. Neoliberal financial institutions' control over international development agendas, technology, and

finance discourages the search for alternatives that are more sensitive to local cultures and environments. Aggressive promotion of technocratic and neoliberal models assures profit among donors, a continuous international supply of agricultural products and natural resource exports, and science and technology transfer from industrialized nations. International development may not be as charitable as donors often portray, as I suggest through my examination of the “business” aspect of international development. Within Nicaragua, indigenous and forest development projects are used as a marketing tool to capture donor investments.

While some development project proposals discuss native empowerment, if indigenous concerns were at the forefront, the resolution of land tenure disputes through land demarcation and titling programs would be central. Instead, many states and donors often allow tenure conflicts to continue. Several “conservation with development” projects in Nicaragua appear to focus on potential revenues from forest products and adjusting local livelihoods to conform to international conservation standards rather than promoting indigenous self-determination. International projects in the tropics discursively frame commerce-oriented strategies and institutional strengthening techniques to strengthen global development agendas, such as the continuation of foreign debt and economic dependency, as well as the “need” for international technical planning and policy support.

The recognition and solidification of indigenous autonomy could impede the donor, business, and state domination of development planning. Perhaps the greatest lesson from my research is the need for improved networking among villages in the RAAN, as well as improved linkages with indigenous institutions in other parts of the

world (scaling up). My evaluation of forest development in eastern Nicaragua reinforces the need for greater access in the RAAN to a broader range of information on market and non-market opportunities, as well as environmental issues. In this interconnected world, cooperation across scales and between locations may be essential to improve social justice, increase equity in the distribution of resources, and assure forest development that is ecologically sustainable into the distant future.

CONTRIBUTIONS OF THIS WORK

The vast majority of politics of scale studies have focused on economic and political powers in industrial core countries located in North America and Europe (e.g., Miller 1997; Swyngedouw 1997a, 1997b; Cox 2002; Leitner 2004; Taylor 2004). While some researchers treat marginalized populations in developed countries (Smith 1992, 1993; Silvern 1999; Williams 1999; Howitt 2003; Marston 2000; Towers 2000; Kurtz 2002, 2003) and a few apply politics of scale to developing countries (Kelly 1997; Newstead et al. 2003; Perreault 2003; Swyngedouw 2004), the application of scale politics to the situation of marginal groups in developing regions deserves greater attention. This work has contributed to filling this gap.

My research clearly fits under the rubric of political ecology and has contributed to this body of literature by expanding the use of scalar analysis in the study of social justice issues. Zimmerer and Bassett (2003) stress the need for greater attention to scale within political ecology, but provide only a general outline for a “political ecology of scale.” Geographers, including Bebbington and Batterbury (2001), Perreault (2003), and Robbins (2004) have experimented with network analysis in the study of neoliberal development. My work potential promotes an expansion of the network methodology because it demonstrates utility in the analysis of various transnational cases.

The case studies in this work coincide with Zimmerer and Bassett’s (2003) conclusion that social and ecological studies need to show dynamic processes at various temporal and spatial ranges. Geographical theory cannot afford to be scale dependent given the multi-scaled nature of social, political, economic, and ecological processes. Successful policy and projects may be more about the articulation of multiple scales

rather than just scaling up or down. Although some development studies mention institutional and ecological scale as important factors, this study consistently used a cross-scale framework. My analysis is unusual because of the significant attention to both state institutions and intermediate scales, along with global and local processes. Nicaragua's recent processes of decentralization at regional and municipal levels and the Miskitu use of multi-village blocs highlight the importance of meso-scale structures to forest development in the region.

Although this work focuses less on pre-1900 processes than some political ecology research, my findings coincide with other researchers' attention to historical domination under processes of colonialism and imperialism. Meanwhile, the degree of detail on contemporary processes (1990 to 2003) I have provided contribute to understanding forest extraction in the Moskitia in the past, present, and future.

My research reinforces the importance of the study of communal property and institutions in order to understand development challenges and opportunities in indigenous territories. For any type of project in common property areas to move forward, whether its institutional structure is private, public, or communal, it is urgent to resolve tenure conflicts, which I suggest requires resolution at various governance levels. Scale and cross-scale linkages are often recognized within common property discussions as requiring more attention (e.g., National Research Council 2002).

My thesis adds to a growing body of literature on communal land tenure in the RAAN. Common-pool resource institution literature had not been used to examine Nicaragua's Caribbean to my knowledge. My research specifically contributes to analysis on communal land tenure as it applies to indigenous institutions. There are many types of

land tenure in Prinzapolka and regimes are constantly changing. What has not changed is that outsiders continue to make claims to indigenous resources. To date, private and state entitlements have been recognized as having more validity than indigenous claims, as occurred in the case of Robert Merrick. Documenting these trends and recording local claims may assist in breaking the cycle of outside control.

My work demonstrated the influential role of transnational networks in Nicaragua's forest sector by tracing financial and technical inputs to the highest scales. I tied these formations to recent conservation trends in development institutions, leading to a greater understanding of the cross-scale nature of policy development and the role of key institutions in the promotion of commerce-based, neoliberal conservation. However, my research suggests the need to further examine differences in attitudes and activities within transnational networks. As one example, Chapin (2004) reports WWF insensitivity to indigenous peoples in Latin American conservation projects, but he recognized the village-level work of the Central American office. My interviews covering WWF-Bilwi's project in Layasiksa suggested high sensitivity among the Nicaraguan staff, of which some were indigenous people. The metaphor of a black box is used when institutions are lumped as a whole. To do complete network analysis of the World Bank, Forest Stewardship Council, CITES, USAID, or WWF would require additional research beyond what I have done in Nicaragua and the United States.

My study builds on decades of human-environment geographical analysis pertaining to Nicaragua's Caribbean (e.g., Parsons 1955; Nietschmann 1973, 1979, 1997; Offen 1999), and pine forests (Parsons 1955; Denevan 1961) by examining interactions in a municipality, Prinzapolka, which had previously received sparse research attention

(but see the work of anthropologist Galio Gurdíán). It also contributes to recent explorations of participation in resource claims (Hale 1994; Proarca/Costas 1997; Hale et al. 1998; Gurdíán et al. 2002; Gordon et al. 2003; Offen 2003, 2004) and management (Christie et al. 2000) from this region by examining forest governance. Although many of these works discussed multiple scales and provided some cross-scale analysis, my research alone focuses on scalar patterns and network configurations. I demonstrate the utility of these concepts when examining the complexity of transnational development networks. The concepts of scale and network are also appropriate to decentralization processes in the RAAN, such as the creation of the autonomous region and municipal governments, as well as discussions of scaling up, such as occurred in multi-village blocs and the regional Miskitu elder council. Intermediary scales from the multi-village bloc to the regional government need to be addressed in RAAN development analysis, and my research may encourage others to highlight these roles.

My results suggest important future research in Nicaragua and beyond. All case study projects in Prinzapolka were in negotiation and implementation stages. It would be valuable to re-contact informants and document change in each of the cases since fieldwork ended. Second, it would be advantageous to compare Nicaragua's situation with other countries. The transnational institutions in Nicaragua's forestry sector are limited and it is risky to judge the role of multilateral finance institutions by the actions of the World Bank, the policies of bilateral lenders by USAID, or environmental organizations by the WWF network. Third, deeper analysis of the interpenetrations between biological and institutional processes should be done in the study area. My discussion of matching ecological and institutional scales demonstrates the relevance of

cultural ecology as practiced by Bernard Nietschmann, William Denevan, and James Parsons. Fourth, a “politics of scale” framework could be used to examine the creation of regional political autonomy as a scalar innovation. Lastly, scale analysis could help to further determine multi-level influences in contemporary Miskitu governance of common-pool forests and resources since the approval of the Autonomy Statute. It would be interesting to build on my preliminary findings from Prinzapolka to further differentiate how modern indigenous governance patterns evolved and continue to transform across the RAAN and, potentially, even into Miskitu regions of Honduras.

APPENDIX ONE

Commonly Utilized Tree Species, Alamikangban, 2002

Name			
Spanish (local)	Miskitu	Latin ²⁸⁴	Uses
aguacate montero	sikia wail	Persea americana	k, p, q, x
caoba del atlántico	yulu	Swietenia macrophylla	c, f, h, n, o, q, t, u, x, aa, cc
capirote	siaya dusa	Miconia spp.	k
cedro macho	saba	Carapa guianenses	c, b, e, f, h, n, o, q, t, u, v, aa, cc
cedro real	yalam	Cedrela odorata	c, f, h, n, o, q, t, u, x, aa, cc
ceiba	sisin	Ceiba pentandra	c, f, h, aa
cola de pavo	bila bila	Cupania cinerea	b, d, k, p
comenegro	slim	Dialium guianense	b, e, i, j, k, q, v, x
cortez	auka	Tabebuia guayacan	b, h, q, t, v, x, bb
coyote	rusut	Plastymiscium pleiostachyum	b, e, h, n, q, u
frijolillo	frijolillo	Mosquitoxylum jamaicense	a, b, i, j, k, n, q, t, u, v, x, cc
guacimo colorado	inupu	Leucea seemannii	q, k
guanacaste blanco	tuburus	Albizia caribaea	c, f, h, k, q, u
guapinol	lauhwa	Hymenaea courbaril	b, h, n, q, u, v, x
guarumo blanco	plang pihni		k, l, m
guarumo rojo	plang pauni		k, l, m
guayabo	labina pihni		h, k, q, u
guayabo charco/negro	labina drapapa	Terminalia amazonia	k
guayabo rojo	labina pauni		h, k, q, u

²⁸⁴ I utilized Serfores (2000), Oporta and López (2000), and SmartWood (2003) as sources for Latin names. The foresters writing these management plans identified commercial species within Prinzapolka. Since there were spelling differences I cross-referenced with INAFOR (1999).

kerosén	sahkal	Tetragastris panamensis	b, e, k, q, u
laurel blanco	sumh	Cordia bicolor	b, c, e, f, h, n, q, u, v, x, cc
leche de maria	kalila mahbra dusa	Symphonia globulifera	b, k, q, u, v, x, cc
mangalarga blanca	sihnak	Vochsia ferruginea	k, p, q
mangalarga blanca (pequeña)	sani		k, p, q, y, z
mangalarga colorada	duran pauni		b, q, u
nanciton	kiaki dusa	Hyeronima alchorneoides	b, h, k, q, u, v, x, cc
níspero	iban	Manilkara zapota	a, b, e, h, i, j, k, u, v, w, x, bb
ojoche	pisba	Brosimum alicastrum	b, e, q, u
palo de agua	yamari	Vochysia hondurensis	b, c, f, n, q, u, v, x
pan blanco	rauhwa pata		k, q, u, v
pata de yanqui	isna		d, i, k, x
pino caribea	awas	Pinus caribaea	b, h, n, q, r, s, u, v, w, x, aa, cc
quitacalzon	labina mairin	Astronium graveolens	h, k, q, u, v
roble	usupum	Tabebuia rosea	a, b, g, h, k, q, u, v, x, bb
santa maría	krasa	Calophyllum brasiliense	c, e, f, h, n, o, q, t, u, cc

Uses

a = ax handle
 b = beam
 c = boat
 d = canoeing or rafting pole
 e = bridge building
 f = canoe
 g = charcoal
 h = commercial lumber sales (roll, timber, or for plywood)
 i = digging stick

j = fences
 k = firewood
 l = fishing rod
 m = fishing trap
 n = furniture
 o = gun handle
 p = harpoon
 q = house building
 r = insect repellent
 s = light source

t = paddles
 u = planks
 v = posts
 w = resin
 x = rice mortar
 y = rope
 z = sacks
 aa = seeds (collected and sold)
 bb = sugar cane press
 cc = washboard

APPENDIX TWO

Alamikangban Land and Resource Questionnaire, fifty households, October 2002

	True	False
1) My family has enough land to use.	30 (60%)	20 (40%)
2) There is state-owned land in Prinzapolka municipality.	09 (18%)	41 (82%)
3) The colonists living on communal land can sell trees.	03 (06%)	47 (94%)
4) The mayor manages our communal forests well.	03 (06%)	47 (94%)
5) The sindiko manages our communal forests well.	05 (10%)	45 (90%)
6) The community manages its communal forests well.	02 (08%)	48 (96%)
7) Reforestation of the community's forests is necessary.	49 (98%)	01 (02%)
8) The companies are bringing the forests to an end.	48 (96%)	02 (04%)
9) How does your family use communal land? (Mark all that correspond.)		
Cultivate—50 (100%)		Gather fruits, plants, medicines—48 (96%)
Fish—50 (100%)		Capture animals or birds to sell—48 (96%)
Hunt—49 (98%)		Conservation—46 (92%)
Log wood to sell—48 (96%)		Spiritual/Ceremonial—03 (06%)
Gather firewood—50 (100%)		
10) What land tenure conflicts does your community have? (Mark all that correspond.)		
Within the community—32 (64%)		With the regional government—05 (10%)
With <i>mestizos</i> —32 (64%)		With other municipalities—04 (08%)
With foreigners—25 (50%)		With other communities—03 (06%)
With the central government—21 (42%)		Indigenous land sales—11 (22%)
With communal leaders—19 (38%)		Lack of demarcation—02 (04%)
With the municipal government—13 (26%)		Maldistribution of land—01 (02%)
With companies—08 (16%)		No land tenure conflicts—00

	True	False
11) My family has enough land to use.	30 (60%)	20 (40%)
12) There is state-owned land in Prinzapolka municipality.	09 (18%)	41 (82%)
13) The colonists living on communal land can sell trees.	03 (06%)	47 (94%)
14) The mayor manages our communal forests well.	03 (06%)	47 (94%)
15) The sindiko manages our communal forests well.	05 (10%)	45 (90%)
16) The community manages its communal forests well.	02 (08%)	48 (96%)
17) Reforestation of the community's forests is necessary.	49 (98%)	01 (02%)
18) The companies are bringing the forests to an end.	48 (96%)	02 (04%)
19) How does your family use communal land? (Mark all that correspond.)		
Cultivate—50 (100%)		Gather fruits, plants, medicines—48 (96%)
Fish—50 (100%)		Capture animals or birds to sell—48 (96%)
Hunt—49 (98%)		Conservation—46 (92%)
Log wood to sell—48 (96%)		Spiritual/Ceremonial—03 (06%)
Gather firewood—50 (100%)		
20) What land tenure conflicts does your community have? (Mark all that correspond.)		
Within the community—32 (64%)		With other municipalities—04 (08%)
With <i>mestizos</i> —32 (64%)		With other communities—03 (06%)
With foreigners—25 (50%)		Indigenous land sales—11 (22%)
With the central government—21 (42%)		Lack of demarcation—02 (04%)
With communal leaders—19 (38%)		Maldistribution of land—01 (02%)
With the municipal government—13 (26%)		No land tenure conflicts—00
With companies—08 (16%)		
With the regional government—05 (10%)		

21) What should be done with colonists on communal land? (Mark only one.)

Force them to leave—40 (80%)

Let the ones already living on the land stay, but they cannot sell the land—05 (10%)

Give a title to those who have been there for at least ten years—05 (10%)

22) Example: A project wants to enter and is promising work, but the community will have to sell five thousand hectares of communal land. Do you want them to enter?

Enter—07 (14%)

Don't enter—43 (86%)

23) Example: A logging company wants to work here. They are offering wood to build ten houses and twenty seasonal jobs for men each year. They will cut five thousand hectares during ten years. Do you want them to enter?

Enter—03 (06%)

Don't enter—47 (94%)

24) Who should administer natural resources in your community? (Mark only one.)

Central government—01 (2%)

Communal leaders/Sindikó—16 (32%)

RAAN government—04 (08%)

Community (by assembly)—23 (46%)

Municipal government—04 (08%)

None of the above—02 (04%)

25) Did a member of your household cut trees from communal land in the past year?

Yes—10 (20%)

No—40 (80%)

If you answered yes, how many trees? 1-9 trees (2), 10-20 trees (7), >20 trees (01)

What species? (List all.) mahogany (09), pine (02)

From where? (List all.) upriver (08), pine plains (02), the Arch (01)

For what use? (List all.) to sell (09), to build my house (03)

26) Does a member of your household load logging trucks at the pier?

Yes—15 (30%)

No—35 (70%)

27) **When it is necessary, who should reforest?** (Mark only one.)

Government—03 (06%)

Community members—10 (20%)

Companies—17 (34%)

Aid organization/NGO—20 (40%)

28) **In your opinion, when should the pine plains be burned?** (Mark only one.)

Every ten years—02 (04%)

Once a year—04 (08%)

Every five years—04 (08%)

Never—40 (80%)

Personal Data

Gender

Men—28 (56%)

Women—22 (44%)

Age

20-29—17 (34%)

60-69—01 (02%)

30-39—12 (24%)

70-79—04 (08%)

40-49—08 (16%)

>80—01 (02%)

50-59—07 (14%)

Formal education

none—18 (36%)

some high school—07 (14%)

some grade school—24 (48%)

technical training—01 (02%)

Occupation

Housewife/mother—20 (40%)

Farmer and rancher—03 (06%)

Farmer—10 (20%)

Carpenter—01 (02%)

Professional—06 (12%)

Retired—01 (02%)

Farmer and logger—05 (10%)

Service industry—04 (08%)

APPENDIX THREE

Interviews, Libraries, Archives, and Collections

Interviews by Institution

Action for Community and Ecology in the Rainforests of Central America*

AFORSA*

Army

Association of Indigenous Women of the Atlantic Coast*

Atlantic Biological Corridor**

Atlantic Coast Research and Documentation Center*

Bluefields Indian Caribbean University

Carl Bro Group**

Center for Education and Research in Tropical Agronomy**

Center for Export Procedures*

Center for Human, Citizen, and Autonomous Rights**

Center for Nature Conservation and Sustainable Development*

Center for Social Science Analysis

CEPISA*

Comptroller

Contigo International**

Convention on International Trade in Endangered Species of Wild Fauna and Flora**

Danish International Development Assistance**

EcoForestal, Inc.**

El Arbolito, S.A.*

Elder Council, Miskitu Communitarian Nation*

Emergency Social Investment Fund*

Export and Investment Center

Foundation for the Autonomy and Development of the Atlantic Coast of Nicaragua*

Global Justice Ecology Project*

Hermanos Úbeda, S. A.*

Home Depot**

Humboldt Center for Territorial and Environmental Studies*

Indian Law Resource Center**

INDUFOR, S.A.*

Institute of Territorial Studies

International Human Rights Law Group**

Land Regularization Project**

Limi-Nawâh**

Lutheran World Relief**

MADENSA**

Meadow Lake Tribal Council**

Ministry of Agriculture, Livestock, and Forests*

Ministry of Environment and Natural Resources*

Multicultural Costeño Party

National Assembly

National Decentralization Commission

National Demarcation Commission

National Environmental Information System

National Forestry Institute

National Organization of the Mayangna Communities of Nicaragua

Network for the Promotion of Sustainable Forestry in the Mining Triangle and

Prinzapolka**

Nicaragua Network**

Nicaraguan Foresters Association

Nitlapán, University of Central America*

Office for Humanitarian Promotion and Development of the Atlantic Coast*

Office for Promotion and Investment in Sustainable Forestry**

Police

Portico**

PRADA, S. A.**

Prinzapolka municipal government (mayor, vice-mayor, councilor, administrator,
consultant, secretary, forester, lumber inspector, judge, civil defense)

Prinzapolka Project*

RAAN governor*

RAAN regional councilors*

Rainforest Alliance**

Rural Titling Office

Secretary of Natural Resources, Production, and Territorial Demarcation*

SmartWood**

Social Development Institute of the Moravian Church

Sons and Daughters of Corn*

State Forest Administration

Supreme Electoral Council

Sustainable Forestry Promotion Project**

Swarah

Swiss International Development Agency**

Technological Transformation and Promotion of Natural Forest Management Project**

United Nations Development Program**

United States Agency for International Development**

University of the Autonomous Region of the Caribbean Coast of Nicaragua*

World Bank**

World Wildlife Fund**

Yapti Tasba Masrika nani

Key

** = transnational institution

* = institution with transnational linkages for finance or information exchange

Libraries, Archives, and Collections

Location

Atlantic Coast Research and Documentation Center

Bilwi, Managua

Bluefields Indian Caribbean University

Bilwi

Border Patrol

Bilwi, Managua

Center for Export Procedures

Bilwi, Managua

Christian Medical Action

Alamikangban

Danish International Development Assistance

Bilwi

Export and Investment Center

Managua

Forestry Promotion Office

Managua

History Institute of Nicaragua and Central America

Managua

International Human Rights Law Group

Bilwi

Ministry of Agriculture, Livestock, and Forests

Managua

Ministry of Environment and Natural Resources	Bilwi, Managua
Municipal Development Institute	Managua
National Agrarian University	Managua
Nitlapán	Managua
Prinzapolka Courthouse	Alamikangban
Prinzapolka Municipal Government	Alamikangban
Prinzapolka Project	Alamikangban
Swiss Agency of International Development	Bilwi, Managua
University of the Autonomous Region of the Caribbean Coast	Bilwi, Managua

APPENDIX FOUR

State Natural Resource Institutions (2002-2003)

Nicaragua's legislative branch is the National Assembly. Forestry issues are treated in the Commission on Natural Resources and the Environment. Matters involving indigenous peoples and the Autonomous Region fall under the Ethnic and Atlantic Coast Affairs Commission. There are ninety-four deputies, of which only three represent the RAAN, although it makes up approximately twenty-five percent of the land mass of the nation.

In 2002 and 2003, the National Assembly was highly polarized, reflecting a split between the two dominate political parties, the Liberal Constitutionalist Party and the Sandinista National Liberation Front. In 2002, some Nicaraguans joked facetiously with me that they had the best National Assembly that money could buy. There was high state corruption during the Alemán administration (1997-2002) leading to court cases against important figures, including the president.

The forestry network within Nicaragua has become increasingly complex over recent decades. During fieldwork, three ministries were responsible for different aspects of forest development. Four distinct institutions under these ministries played a role in forest development. Communication between branches was poor. Officials created this structure as a means to reduce control by any particular interest group or sector. An argument could be made that it created disorder and overlap.

INAFOR was created under the Ministry of Agriculture, Livestock, and Forestry (MAG-FOR) in 1998 and was responsible for forest extraction permitting and monitoring. This relationship was complicated by the fact that INAFOR's central office was not located within the MAG-FOR complex, but rather at the side of Managua in the

Ministry of Environment and Natural Resources (MARENA) complex. PROFOR was created in 2001 under MAG-FOR, and was housed with the ministry, which limited its impact on INAFOR.

INAFOR's financial difficulties limit its efficacy. In 2003, INAFOR had less than one hundred twenty inspectors for the three million hectares of forest in the nation. According to a logging company owner in early 2003, "Forest policy is stagnating because the country needs money. If INAFOR does not give permission to cut forests, they will not be able to pay their workers...INAFOR can't have policy because they have to focus on survival."²⁸⁵ The head of the environmental ministry stated that it was "paradoxical" that INAFOR had a budget that originated from permits for exploiting the nation's forests (as quoted in Imhof 2003a: Internet; translated by author).

Earnings from mahogany kept much of the rest of Nicaraguan logging sector afloat, in spite of excessive bureaucracy and widespread inefficiency. A mahogany-dominated sector inundated with illegality was easier to maintain than to change, and it signified profit for many political elite. During interviews, respondents often linked the lack of a forestry law during the 1990s and into the early 2000s to personal economic interests in forestry companies on the part of high-level state officials. Elites' control over forestry norms in the National Assembly assured that fundamental reform would not threaten profits to corporations. The assembly stalled passage of a forestry law for over a decade, which encouraged illicit behavior for two reasons. The law would have created a deterrent for criminal activities because it increased punishment. Second, the lack of legislation impeded investment security in legal operations, therefore, making illegality the only option in many places. There was an incentive to extract mahogany because people were not sure if it would be prohibited based on the forestry law under discussion.

²⁸⁵ Pers. comm., Spanish, 01/23/03.

A RAAN INAFOR official stated:

National Assembly deputies did not pass the forestry law for a decade because of political interests. During the previous administration, many deputies invested in logging companies. The law would have had an impact on their wallets.²⁸⁶

With deputy changes in the National Assembly and the entrance of President Bolaños in 2003, the policy environment changed in Managua and a much awaited forest law passed. While the 2003 law created and reinforced several new institutions, during fieldwork, it was too early to document implementation. As designed, CONAFOR would have a greater role in formulating the forestry policy of MAG-FOR and overseeing INAFOR and a new National Forestry Development Fund (FONADEFO). The sources for this fund were to be national and international. FONADEFO would receive fifty percent of the monies collected from fines and lumber auctions, along with contributions from international donors and aid organizations. There would be regional, departmental, and municipal forestry commissions created to work with CONAFOR.

At the time of fieldwork, there was concern that the changes made by passing the forestry law and its regulations (Decree #73-2003) may not be sufficient to strengthen or transform the forest sector. Some articles in the law reinforced policies that already existed. For example, it mandated INAFOR decentralization into districts, which had already initiated based on an earlier decree. According to a RAAN INAFOR delegate, “The Forestry Law will give legal backing to activities that we are already doing, but there will not be major improvements because there is not anything new.”²⁸⁷ This comment depicted on-going doubt and cynicism from regional officials. However, national officials and international organizations, in particular WWF, believed that the law would create a more secure investment environment, reduce perverse incentives for

²⁸⁶ Pers. comm., Spanish, 11/19/03.

²⁸⁷ Pers. comm., Spanish, 11/19/03.

illegal activities, and create positive incentives for sustainable activities. At the time of fieldwork, it was too soon to judge if these objectives would be met.

The National Forest Commission (CONAFOR) was created in 1998, but its role remained weak until the 2003 forestry law. Although heavily influenced by the state, CONAFOR included non-state actors, such as private companies. Its function was to formulate forestry development policies. The hope was that forest institutions could transition from their traditional role of policing activities towards a more proactive role in promoting development.

In 2000, Nicaragua had a total of seventy-three protected areas, which covered seventeen percent of the entire country (Weaver and Bauer 2000). These were overseen by MARENA. At the time of fieldwork, MARENA's most important responsibility was the ABC, which included the nation's largest protected areas. CITES also functioned under MARENA through an institutional ad-hoc committee named by the minister (Saénz and Morales 1997). There were no civil society representatives on the CITES board.

MARENA previously had wider responsibilities in forest sector. From 1994 until 1998 MARENA officials were responsible for logging concession permits. INAFOR was created in 1998 for this purpose. When this transition occurred it brought about a process of recentralization. Authority shifted from the regional office of MARENA to the central office of INAFOR in the capital city of Managua. Regional officials were still responsible for the transport guides for lumber, but harvesting permits originated in Managua. In 2003 INAFOR was undergoing a process of decentralization. In intermediate stages, permitting was shared between national and regional INAFOR officials.

The State Forest Administration (ADFOREST), under the Ministry of Finance, Industry and Commerce (MIFIC), was responsible for the management of state-owned forests. ADFOREST was created in 1993 by the Chamorro administration. ADFOREST was an example of a neoliberal state institution because it aimed to resolve complex political, cultural, and economic problems by means of the simple functioning of the market (Hale et al. 1998). The industrialization of forested areas and their placement under forest concessions was believed to be the first defense against the advancement of the agricultural frontier. It was assumed that there would be social and economic benefit for the nearby communities from extraction. At the time of fieldwork, ADFOREST was in limbo in the RAAN because most state forests corresponded with indigenous communal land claims. The lack of land demarcation and titling delayed concessions because they could not be granted in areas with unclear or contested land tenure.

Land tenure insecurity and biodiversity loss are problems facing forest administrators in Nicaragua. Governance scales and sectors often do not agree on solutions. A national INAFOR official, Mario Rocha, recognized that land tenure insecurity is an impediment to long-term management and that communities need to put together “a rational land claim” and work to have their rights legalized.²⁸⁸ However, he believed that communities often claim too much land and “now with mahogany, there are even more problems.” Rocha suggested that tenure conflicts have increased because people are economically motivated to fight for land rights. Before, mahogany was not on people’s minds, “but now it is being cut so much that it is being extinguished. They are going to have to change to other species and not just focus on one. They just see one species as profitable – this needs to change.” Again, Rocha blamed local populations, who would be willing to sell wood of many other species, if they could find a market.

²⁸⁸ Pers. comm., Spanish, 12/14/02.

APPENDIX FIVE

Photo Gallery



Alamikangban Assembly



Siks Tawan Sindiko Elections



Mahogany Rafts



Ten-Inch Mahogany



Cree Dancer, Limi-Nawâh Inauguration



Researcher in WWF Office, Bilwi (Knapp 2003)

GLOSSARY

ABC—Atlantic Biological Corridor

BICU—Bluefields Indian Caribbean University

CACRC—Central American and Caribbean Research Council

CATIE—Center for Education and Research in Tropical Agronomy

CEPISA—Pine Export Company

CI—Conservation International

CIDA—Canadian International Development Agency

CITES—Convention on International Trade in Endangered Species of Wild Fauna and
Flora

CORFOP—People's Forestry Corporation

DANIDA—Danish International Development Assistance

FAO—Food and Agriculture Organization

FSC—Forest Stewardship Council

FSLN—Sandinista National Liberation Front

GEF—Global Environmental Facility

GFTN—Global Forest Trade Network

IACHR—Inter-American Commission for Human Rights

ICDP—Integrated Conservation with Development Programs

IDB—Inter-American Development Bank

INAFOR—National Forestry Institute

INFONAC—National Development Institute

IRENA—Institute of Natural Resources

IUCN—World Conservation Union

MADENSA—Maderas y Derivados de Nicaragua, Sociedad Anonima

MAG-FOR—Ministry of Agriculture, Livestock, and Forests

MARENA—Ministry of Environment and Natural Resources

MBC—Mesoamerican Biological Corridor

MISURASATA—Miskito, Sumu, Rama and Sandinista United

MLTC—Meadow Lake Tribal Council

NGO—nongovernmental organization

OAS—Organization of American States

POF 98—Operative Forestry Plan 1998

PRA 2000—Autonomous Region Plan 2000

PROARCA—Regional Environmental Program for Central America

PRODEP—Land Regularization Project

PROFOR—Sustainable Forestry Promotion Project

RAAN—North Atlantic Autonomous Region

REFROMAB—Network for the Promotion of Sustainable Forestry in the Mining
Triangle and Prinzapolka

SCS—Scientific Certification Systems

SERENA—Secretary of Natural Resources, Production, and Territorial Demarcation

SOLCARSA—Sol del Caribe, Sociedad Anonima

TFAP—Tropical Forestry Action Plan

TNC—The Nature Conservancy

TRAFFIC—Trade Record Analysis of Flora and Fauna in Commerce

TRANSFORMA—Technological Transformation and Promotion of Natural Forest
Management Project

UNDP—United Nations Development Program

UNEP—United Nations Environmental Program

URACCAN— University of the Autonomous Region of the Caribbean Coast of
Nicaragua

USAID—United States Agency for International Development

WWF—World Wildlife Fund

BIBLIOGRAPHY

- Aber, J. D. and J. M. Melillo (1991). Terrestrial Ecosystems. Philadelphia, Sanders College Publishing.
- Acosta, M. L. (1996). La Constitución y los Pueblos Indígenas de la Costa Atlántica de Nicaragua. Managua, Agencia Canadiense para el Desarrollo Internacional.
- ADFOREST (1992). Propuesta de ADFOREST para el desarrollo forestal en la RAAN. Managua, Administración Forestal Estatal.
- Adger, W. N., T. A. Benjaminsen, K. Brown and H. Svarstad (2001). "Advancing a Political Ecology of Global Environmental Discourses." Development and Change 32: 681-715.
- Agnew, J. (1993). Representing Space: Space, scale and culture in social science. Place/Culture/Representation. J. Duncan and D. Ley. New York, Routledge: 251-271.
- Agnew, J. (1997). "The dramaturgy of horizons: geographical scale in the 'Reconstruction of Italy' by the new Italian political parties, 1992-95." Political Geography 16(2): 99-121.
- Agnew, J. (1999). The New Geopolitics of Power. Human Geography Today. D. Massey, J. Allen and P. Sarre. Cambridge, Polity: 173-193.
- Agrawal, A. (2001a). "Common Property Institutions and Sustainable Governance of Resources." World Development 29(10): 1649-1672.
- Agrawal, A. (2001b). "Common property, forest management and the Indian Himalayas." Contributions to Indian Sociology 35(2): 181-212.
- Agrawal, A. and C. Gibson (1999). "Enchantment and Disenchantment: The Role of Community in Natural Resource Conservation." World Development 27(4): 629-649.
- Aguilar, G. and M. González (1999). Regional Legal Arrangements for Forests: the Case of Central America. Assessing the International Forest Regime. R. G. Tarasofsky. Cambridge, The World Conservation Union: 113-123.
- Aguilera, A. (2003). Nueva Ley Forestal podría atraer millones. Managua, La Prensa: 5B.

- Alcorn, J. B. and V. M. Toledo (1998). Resilient resource management in Mexico's forest ecosystems: the contribution of property rights. Linking Social and Ecological Systems: Management Practices and Social Mechanisms for Building Resilience. F. Berkes and C. Folke. Cambridge, Cambridge University Press: 216-249.
- Alemán Cunningham, C. and A. Barbeyto (2001). Cultura Política en el Atlántico Norte. Managua, Universidad de las Regiones Autónomas de la Costa Caribe Nicaragüense.
- Alemán Cunningham, C. J. (2002). Strengthening local institutions: The case of the Miskitu People of the North Atlantic Autonomous Region of Nicaragua. Managua, Universidad de las Regiones Autónomas de la Costa Caribe Nicaragüense.
- Alexander, E. B. (1973). "A comparison of forest and savanna soils in Northeastern Nicaragua." Turrialba 23: 181-191.
- Alves-Milho, S. F. (1996). Dinámica del Sector Forestal en Nicaragua 1960-1995. Managua, ESECA/UNAN/UNA.
- Amin, A. (1997). "Placing globalization." Theory, Culture and Society 14: 123-137.
- Anaya, S. J. (1997). Comunidad de Awas Tingni y Otros v. Nicaragua, Caso #11.577, Summary of Petitioners' Submission at Hearing on March 4, 1997, Comisión Interamericana de Derechos Humanos, Washington, D.C.
- Anaya, S. J. (2002). El Alcance de la Sentencia de la Corte Interamericana de Derechos Humanos en el Caso Awas Tingni y sus Implicaciones para los Pueblos Indígenas de Nicaragua. Forum Awas Tingni, URACCAN, Bilwi, Nicaragua.
- Anaya, S. J. and T. S. Crider (1996). "Indigenous Peoples, the Environment, and Commercial Forestry in Developing Countries: The Case of Awas Tingni, Nicaragua." Human Rights Quarterly 18: 345-367.
- Anderson, R. B. (1997). "Corporate/Indigenous Partnerships in Economic Development: The First Nations in Canada." World Development 25(9): 1483-1503.
- Anderson, R. B. (2002). Aboriginal Entrepreneurship and Business Development. North York, Ontario, Captus.
- Anderson, R. B. and R. M. Bone, Eds. (2003). Natural Resources and Aboriginal People in Canada: Readings, Cases, and Commentary. Concord, Ontario, Captus.

- Annis, S. (1988). Can Small-scale Development be Large-scale Policy? Direct to the Poor: Grassroots Development in Latin America. S. Annis and P. Hakim. Boulder, Lynne Rienner: 209-218.
- Arana, M. (1997). General Economic Policy. Nicaragua Without Illusions: Regime Transition and Structural Adjustment in the 1990s. T. W. Walker. Wilmington, Scholarly Resources: 81-96.
- Arnold, J. E. M. (1992). Community Forestry: Ten Years in Review. Rome, Food and Agriculture Organization.
- Ascher, W. (1999). Why Governments Waste Natural Resources: Policy Failures in Developing Countries. Baltimore, Johns Hopkins University Press.
- Assies, W. (2000). Land, Territories, and Indigenous Peoples' Rights. Current Land Policy in Latin America: Regulating Land Tenure Under Neo-liberalism. A. Zoomers and G. van der Haar. Amsterdam, Royal Tropical Institute: 93-109.
- Aviles, J. (1992). La Concesión Taiwanese y los Sumos. Persistencia Indígena en Nicaragua. CIDCA. Managua, Centro de Investigaciones y Documentación de la Costa Atlántica: 199-248.
- Baltodano, M. (2002). Descentralización y Participación Ciudadana. III Foro Mesoamericano Frente al Plan Puebla-Panamá, El Movimiento Mesoamericano por a Integración Popular, 16-18 de julio, Managua.
- Barborak, J. R. (1992). History of Protected Areas and Their Management in Central America. Changing Tropical Forests: Historical Perspectives on Today's Challenges in Central and South America. H. K. Steen and R. P. Tucker. Durham, Forest History Society: 93-101.
- Barnes, B. V., D. R. Zak, S. R. Denton and S. H. Spurr. (1998). Forest Ecology. New York, John Wiley & Sons.
- Bassett, T. J. and K. B. Zueli (2000). "Environmental Discourses and the Ivorian Savanna." Annals of the Association of American Geographers 90(1): 67-95.
- BCN (1975). Programa forestal. Reporte y análisis de resultados. Managua, Banco Central de Nicaragua.
- Bebbington, A. J. (1996). Movements, Modernizations, and Markets: Indigenous organizations and agrarian strategies in Ecuador. Liberation Ecologies: Environment, Development, Social Movements. R. Peet and M. Watts. London, Routledge: 86-109.

- Bebbington, A. J. and S. P. J. Batterbury (2001). "Transnational Livelihoods and Landscapes: Political Ecologies of Globalization." Ecumene 8(4): 369-380.
- Beier, P. and R. F. Noss (1998). "Do Habitat Corridors Provide Connectivity?" Conservation Biology 12(6): 1241-1252.
- Bell, C. N. (1899/1989). Tangweera. Life and Adventures among Gentle Savages. Austin, University of Texas Press.
- Bennett, A. F. (2003). Linkages in the Landscape: The Role of Corridors and Connectivity in Wildlife Conservation. Cambridge, World Conservation Union.
- Berkes, F. (2002). Cross-Scale Institutional Linkages: Perspectives from the Bottom Up. The Drama of the Commons. National Research Council. Washington, D.C., National Academy Press: 293-321.
- Berkes, F., J. Colding, C. Folke (2000). "Rediscovery of Traditional Ecological Knowledge as Adaptive Management." Ecological Applications 10(5): 1251-1262.
- Berkes, F. and C. Folke, Eds. (1998). Linking Social and Ecological Systems: Management Practices and Social Mechanisms for Building Resilience. Cambridge, Cambridge University Press.
- Berry, S. (1994). "Resource Access and Management as Historical Processes." IDS Working Paper 13: 24-45.
- Bird, J. (1956). "Scale in regional study illustrated by brief comparisons between the western peninsulas of England and France." Geography 41: 25-38.
- Blaikie, P. (1994). Political Ecology in the 1990s: An Evolving View of Nature and Society. East Lansing, Michigan State University.
- Blaikie, P. (1995a). "Changing Environments or Changing Views: A Political Ecology for Developing Countries." Geography 80(3): 203-214.
- Blaikie, P. (1995b). Understanding Environmental Issues. People and Environment. S. Morse and M. Stocking. London, UCL Press: 1-30.
- Blaikie, P. (1999). "A Review of Political Ecology: Issues, Epistemology and Analytical Narratives." Zeitschrift fur Wirtschaftsgeographie 43(3-4): 131-147.
- Blaikie, P. and H. Brookfield, Eds. (1987). Land Degradation and Society. London, Methuen.

- Blaikie, P. and S. Jeanrenaud (1997). Biodiversity and Human Welfare. Social Change and Conservation: Environmental Politics and Impacts of National Parks and Protected Areas. K. B. Ghimire and M. Pimbert. London, Earthscan: 47-70.
- Blundell, A. G. and R. E. Gullison (2003). "Poor regulatory capacity limits the ability of science to influence the management of mahogany." Forest Policy and Economics 5: 395-405.
- Blundell, A. G. and B. D. Rodan (2003). "Mahogany and CITES: moving beyond the veneer of legality." Oryx 37(1): 85-90.
- Boucher, D. H. and M. A. Mallona (1997). "Recovery of the rain forest tree *Vochsia ferruginea* over 5 years following Hurricane Joan in Nicaragua: a preliminary population projection matrix." Forest Ecology and Management 91: 195-204.
- Brandon, K. (2001). Moving Beyond Integrated Conservation and Development Projects (ICDPs) to Achieve Biodiversity Conservation. Tradeoffs or Synergies? D. R. Lee and C. B. Barrett. Oxon, CAB International: 417-432.
- Brechin, S. R., P. R. Wilshusen, C. L. Fortwangler and P.C. West. (2002). "Beyond the Square Wheel: Toward a More Comprehensive Understanding of Biodiversity Conservation as Social and Political Process." Society and Natural Resources 15: 41-64.
- Brenes Flores, M. H. (7 de diciembre de 2001). Sustituyen al Vice Alcalde de Prinzapolka. Managua, El Nuevo Diario. <http://www-ni.elnuevodiario.com.ni.archivo>. Accessed 7 December 2001.
- Brenner, N. (1998). "Between fixity and motion: accumulation, territorial organization and the historical geography of spatial scales." Environment and Planning D: Society and Space 16: 459-481.
- Brenner, N. (2000). "The Urban Question as a Scale Question: Reflections on Henri Lefebvre, Urban Theory and the Politics of Scale." International Journal of Urban and Regional Research 24(2): 361-378.
- Brenner, N. (2001). "The limits to scale? Methodological reflections on scalar structuration." Progress in Human Geography 25(4): 591-614.
- Bridge, G. (1997). "Mapping the terrain of time-space compression: power networks in everyday live." Environment and Planning D: Society and Space 15: 611-626.

- Brook, M. M. (1999). Decentralization, Forest Use, and Indigenous Land Tenure in Nicaragua's Northern Autonomous Region. Unpublished M.A. thesis, Latin American Studies. New Orleans, Tulane University.
- Brook, M. M. (2003). The Re-scaling of Indigenous Forestry: Case Studies from Northeastern Nicaragua. Congress on globalization, localization and tropical forest management in the 21st Century, Amsterdam, available from author.
- Brook, M. M. (2004). "Esquemas Institucionales para el Manejo del Bosque en Prinzapolka: Relaciones entre Actores Ubicados en Distintos Niveles." Wani 37: 7-26.
- Brosius, J. P. and D. Russell (2003). "Conservation from Above: An Anthropological Perspective on Transboundary Protected Areas and Ecoregional Planning." Journal of Sustainable Forestry 17(1/2): 39-65.
- Brown, K. (1998). "The political ecology of biodiversity conservation and development in Nepal's Terai: Confused meanings, means and ends." Ecological Economics 24: 73-87.
- Brown, K. (2002). "Innovations for conservation and development." The Geographical Journal 168(1): 6-17.
- Brown, K. and S. Rosendo (2000). "Environmentalists, Rubber Tappers and Empowerment: The Politics and Economics of Extractive Reserves." Development and Change 31: 201-227.
- Bruce, J. W. (1999). Legal Bases for the Management of Forest Resources as Common Property. Rome, Food and Agriculture Organization.
- Bryant, R. L. and S. Bailey (1997). Third World Political Ecology. London, Routledge.
- Bryant, R. L. and G. A. Wilson (1998). "Rethinking Environmental Management." Progress in Human Geography 22(3): 321-343.
- Burger, J., C. Field, R.B. Norgaard, E. Ostrom and D. Policansky (2001). Common-Pool Resources and Commons Institutions. Protecting the Commons: A Framework for Resource Management in the Americas. J. Burger, E. Ostrom, R. B. Norgaard, D. Policansky and B. D. Goldstein. Washington, D.C., Island Press: 1-15.
- Bustamante, J. and G. Ruíz (2000). Plan General de Manejo "El Limon #2". Prinzapolka, Nicaragua.

- Butler, J. (1997). The Peoples of the Atlantic Coast. Nicaragua Without Illusions. T. W. Walker. Wilmington, Scholarly Resources: 219-234.
- Campbell, J. G. and A. Martin (2000). Financing the Global Benefit of Forests: The Bank's GEF Portfolio and the 1991 Forest Strategy. Washington, D. C., World Bank.
- Campbell, T. (2003). Co-management of Aboriginal Resources. Natural Resources and Aboriginal People in Canada: Readings, Cases, and Commentary. R. B. Anderson and R. M. Bone. Concord, Ontario, Captus Press: 47-52.
- Carino, J. (2004). "Indigenous Voices at the Table: Restoring Local Decision Making on Protected Areas." Cultural Survival Quarterly Spring: 23-27.
- Carr III, A. (2004). "What are Central America's parks *for*?" Wild Earth Spring/Summer: 34-39.
- Cash, D. W. and S. C. Moser (2000). "Linking global and local scales: designing dynamic assessment and management processes." Global Environmental Change 10: 109-120.
- Cashore, B. (2002). "Legitimacy and the Privatization of Environmental Governance: How Non-State Market-Driven (NSMD) Governance Systems Gain Rule-Making Authority." Governance: An International Journal of Policy, Administration, and Institutions 15(4): 503-529.
- Cashore, B., G. Auld, D. Newsom. (2004). Governing Through Markets: Forest Certification and the Emergence of Non-state Authority. New Haven, Yale University Press.
- Castells, M. (1996). The rise of the network society. Oxford, Blackwell.
- Castillo, J. (2002). El Alcance de la Sentencia de la Corte Interamericana de Derechos Humanos en el Caso Awas Tingni y sus Implicaciones para los Pueblos Indígenas de Nicaragua. Forum Awas Tingni, URACCAN, Bilwi, Nicaragua.
- Castro, A. P. and E. Nielson (2001). "Indigenous people and co-management: implications for conflict management." Environmental Science and Policy 4: 229-239.
- CBA (2000). Recopilación de Leyes y Decretos sobre los Pueblos Indígenas de Nicaragua del Año 1877 al Año 2000. Managua, MARENA.

- CBA (2003). Planes de Desarrollo Comunitario, Componente de Planificación y Monitoreo, Proyecto Corredor Biológico del Atlántico.
- CCAD-RUTA (2000). Inventario de Proyectos Ambientales de Centroamérica: Informe Nacional Nicaragua, Versión Ejecutiva, Unidad Regional de Asistencia Técnica, Comisión Centroamericana de Ambiente y Desarrollo.
- Centeno, M. (11 de enero de 2004). Desaparece el alcalde Tripa. Managua, El Nuevo Diario. <http://www-ni.elnuevodiario.com.ni.archivo>. Accessed on 9 May 2004.
- Centeno, M. (13 de mayo de 2002). Preso vicealcalde de Prinzapolka. Managua, El Nuevo Diario. <http://www-ni.elnuevodiario.com.ni.archivo>. Accessed on 13 May 2004.
- Centeno, M. (29 de abril de 2001). Venden Prinzapolka. Managua, El Nuevo Diario. <http://www-ni.elnuevodiario.com.ni.archivo>. Accessed on 9 May 2004.
- Centro Humboldt/CAPRI (1992). El desafío de la Autonomía. Managua, Centro Humboldt/Centro de Apoyo a Programas y Proyectos.
- César Perafán, C. (2000). Informe de Trabajo: Adecuación de servicios financieros a las economías tradicionales indígenas. Washington, D. C., Inter-American Development Bank.
- CGR (n.d.). Diagnóstico Ambiental sobre las Concesiones y Permisos de Aprovechamiento Forestal en la RAAN. Bilwi, Contraloría General de la Republica.
- Chapin, M. (2004). "A Challenge to Conservationists." World Watch November/December: 17-31.
- Christie, P., D. Bradford, R. Garth, B. González, M. Hostetler, O. Morales, R. Rigby, B. Simmons, E. Tinkam, G. Vega, R. Vernooy and N. White (2000). Taking Care of What We Have: Participatory Natural Resource Management on the Caribbean Coast of Nicaragua. Managua, Centro de Investigaciones y Documentación de la Costa Atlántica.
- CITES Secretariat (2003). CITES trade controls to take effect for mahogany. Geneva. http://www.cites.org/eng/news/press_release.shtml. Accessed on 11 February 2004.
- Clancy, M. (1998). "Commodity chains, services and development: theory and preliminary evidence from the tourism industry." Review of International Political Economy 5: 122-148.

- Cleaver, F. (2000). "Moral Ecological Rationality, Institutions and the Management of Common Property Resources." Development and Change 31: 361-383.
- COFORNO (2000). Plan General de Manejo "Kukalaya," Empresa Forestal PRADA, S.A. Prinzapolka, Nicaragua, Consultoria Forestal del Norte.
- Colchester, M. (1997). Salvaging Nature: Indigenous Peoples and Protected Areas. Social Change and Conservation: Environmental Politics and Impacts of National Parks and Protected Areas. K. B. Ghimire and M. Pimbert. London, Earthscan: 97-130.
- Colchester, M. (2000). "Self-determination or Environmental Determinism for Indigenous Peoples in Tropical Forest Conservation." Conservation Biology 14(5): 1364-1367.
- Colchester, M. (2003). Salvaging Nature: Indigenous Peoples, Protected Areas and Biodiversity Conservation. Moreton-in-Marsh, UK, Forest Peoples Programme.
- Conklin, B. A. and L. R. Graham (1995). "The Shifting Middle Ground: Amazonian Indians and Eco-Politics." American Anthropologist 97(4): 695-710.
- Contigo International (2002). Prinzapolka-Bambana Community Development Project: Project Implementation Plan. Managua, CIDA.
- Conzemius, E. (1932). Ethnographical Survey of the Miskito and Sumu Indians of Honduras and Nicaragua. Washington, D. C., Smithsonian Institution.
- Cooke, P. and K. Morgan (1993). "The network paradigm: new departures in corporate and regional development." Environment and Planning D: Society and Space 11: 543-564.
- Cordón, E. (2001). Conception of Fire Use of the Indigenous Miskitu and of Forest Technicians in Waspam, Rio Coco RAAN, Nicaragua. Managua, Universidad de las Regiones Autónomas de la Costa Caribe Nicaragüense.
- Cox, K. R. (1998). "Spaces of dependence, spaces of engagement and the politics of scale, or: looking for local politics." Political Geography 17(1): 1-23.
- Cox, K. R. (2002). "Globalization," the "Regulation Approach," and the Politics of Scale. Geographies of Power: Placing Scale. A. Herod and M. W. Wright. Oxford, Blackwell Publishers: 85-114.
- Cox, K. R. and A. Mair (1991). "From localised social structures to localities as agents." Environment and Planning A 23: 197-213.

- CRAAN/WWF/INAFOR (2003). Estrategia de Desarrollo Forestal para la Región Autónoma del Atlantico Norte, Nicaragua. Bilwi, Comité Consultivo Forestal.
- Cunningham, L. (2002). El Alcance de la Sentencia de la Corte Interamericana de Derechos Humanos en el Caso Awas Tingni y sus Implicaciones para los Pueblos Indígenas de Nicaragua. Forum Awas Tingni, URACCAN, Bilwi, Nicaragua.
- Daly, H. E. (1992). "Allocation, distribution, and scale: towards an economics that is efficient, just, and sustainable." Ecological Economics 6: 185-193.
- De Camino, R. (1997). Las Condiciones para el Manejo Forestal en Nicaragua, especial referencia a la situación de la RAAN y RAAS. Managua, ASDI.
- Delaney, D. and H. Leitner (1997). "The political construction of scale." Political Geography 16(2): 93-97.
- Denevan, W. M. (1961). The Upland Pine Forests of Nicaragua: A Study in Cultural Plant Geography. Berkeley, University of California Press.
- Díaz-Polanco, H. and G. López y Rivas (1992). "Fundamentos de la Autonomía Regional." Boletín de Antropología Americana 25: 157-164.
- Dicken, P. and M. Hassler (2000). "Organizing the Indonesian clothing industry in the global economy: the role of business networks." Environment and Planning A 32: 263-280.
- Dicken, P., P. F. Kelly, K. Olds and H.W-C. Yeung (2001). "Chains and networks, territories and scales: towards a relational framework for analysing the global economy." Global Networks 1(2): 89-112.
- Dinerstein, E., G. Powell, D. Olson, E. Wikramanayake, R. Abell, C. Loucks, E. Underwood, T. Allnutt, W. Wettengel, T. Ricketts, H. Strand, S. O'Connor and N. Burgess (2000). A Workbook for Conducting Biological Assessments and Developing Biodiversity Visions for Ecoregion-based Conservation. Washington, D. C., World Wildlife Fund.
- Dolsak, N. and E. Ostrom, Eds. (2003). The Commons in the New Millennium: Challenges and Adaptation. Cambridge, MIT Press.
- Dozier, C. L. (1985). Nicaragua's Mosquito Shore: The Years of British and American Presence. Alabama, University of Alabama Press.

- Downes, D. R. (1999). Global Forest Policy and Selected International Instruments: A Preliminary Review. Assessing the International Forest Regime. R. G. Tarasofsky. Cambridge, UK, World Conservation Union: 65-93.
- Dryzek, J. S. (1997). The Politics of the Earth: Environmental Discourses. Oxford, Oxford University Press.
- Duarte, L. E. (1998). ¿Fracasó la Moratoria Forestal? La Prensa. Managua: 1A, 3A.
- Dunbar-Ortiz, R. (1990). "The Future of the Miskito People in a Troubled Borderland." Nicaraguan Perspectives(19): 15-19.
- Eccleston, B. (1996). "Does North-South Collaboration Enhance NGO Influence on Deforestation Policies in Malaysia and Indonesia?" Journal of Commonwealth and Comparative Politics XXXIV(1): 66-89.
- Elizondo, D. (1997). The Environment. Nicaragua Without Illusions: Regime Transition and Structural Adjustment in the 1990s. T. Walker, W. Wilmington, DE, Scholarly Resources: 131-145.
- Elliott, C. (2000). Forest Certification: A Policy Perspective. Jakarta, Center for International Forestry Research.
- EPOCA (1986). Nicaragua: An Environmental Perspective. San Francisco, The Environmental Project on Central America, Earth Island Institute: 8.
- Escobar, A. (1995). Encountering Development: The Making and Unmaking of the Third World. Princeton, Princeton University Press.
- Escobar, A. (1996). Constructing Nature: Elements for a poststructural political ecology. Liberation Ecologies: Environment, Development, Social Movements. R. Peet and M. Watts. London, Routledge: 46-68.
- Faiman-Silva, S. (1997). Chactaws at the Crossroads: The Political Economy of Class and Culture in the Oklahoma Timber Region. Lincoln, University of Nebraska Press.
- Fairhead, J. and M. Leach (1998). Reframing Deforestation: Global analyses and local realities: Studies in West Africa. New York, Routledge.
- Feder, G. and A. Nishio (1999). "The benefits of land registration and titling: economic and social perspectives." Land Use Policy 15(1): 25-43.

- Fernando Solórzano, G. D. (1922). Compilación de leyes sobre el impuesto forestal. Managua, Tipografía y Encuadernación Nacional.
- Fleming, C. (1850). The Mahogany Tree: Its Botanical Characters, Qualities and Uses, with Practical Suggestions for Selecting and Cutting it in the Regions of its Growth. Liverpool, Rockliff and Son.
- Fogel, C. (2004). The Local, the Global, and the Kyoto Protocol. Earthly Politics: Local and Global in Environmental Governance. S. Jasanoff and M. L. Martello. Cambridge, MIT Press: 103-125.
- Gabriel, J. (1996). "UNO. What happened to autonomy? Politics and ethnicity on Nicaragua's Atlantic Coast." Ethnic and Racial Studies. 19(1): 158-185.
- Gale, F. (1998). "Constructing Global Civil Society Actors: An Anatomy of the Environmental Coalition Contesting the Tropical Timber Trade Regime." Global Society 12(3): 343-361.
- GEF (1997). Nicaragua: Atlantic Biological Corridor Project. Washington, D.C., Global Environmental Facility/World Bank.
- Geores, M. E. (2003). The Relationship between Resource Definition and Scale: Considering the Forest. The Commons in the New Millennium: Challenges and Adaptation. N. Dolsak and E. Ostrom. Cambridge, MIT Press: 77-97.
- Gereffi, G. (1995). Global production systems and third world development. Global Change, Regional Response: The New International Context of Development. B. Stallings. Cambridge, Cambridge University Press: 100-142.
- Gereffi, G. (1999). "International trade and industrial upgrading in the apparel commodity chain." Journal of International Economics 48: 37-70.
- Gereffi, G. and M. Korzeniewicz, Eds. (1994). Commodity Chains and Global Capitalism. Westport, Greenwood Press.
- Ghimire, K. B. and M. Pimbert, Eds. (1997). Social Change and Conservation: Environmental Politics and Impacts of National Parks and Protected Areas. London, Earthscan.
- Gibson-Graham, J. K. (2002). Beyond Global vs. Local: Economic Politics Outside the Binary Frame. Geographies of Power: Placing Scale. A. Herod and M. W. Wright. Oxford, Blackwell Publishers: 25-60.

- Gibson, C. (2001). Forest Resources: Institutions for Local Governance in Guatemala. Protecting the Commons: A Framework for Resource Management in the Americas. J. Burger, E. Ostrom, R. B. Norgaard, D. Policansky and B. D. Goldstein. Washington, D.C., Island Press: 71-89.
- Gibson, C. C., M. A. McKean, and E. Ostrom. (2000). People and Forests: Communities, Institutions, and Governance. Cambridge, MIT Press.
- Gibson, C. C., E. Ostrom and T. K. Ahn. (2000). "The concept of scale and the human dimensions of global change: a survey." Ecological Economics 32: 217-239.
- Gibson, G. L. (1994). Resultados de los Ensayos Internacionales de Procedencias. Pinos de Nicaragua. MARENA-DANIDA. Managua: 17-27.
- Giddens, A. (1984). The Constitution of Society: Outline of the Theory of Structuration. Berkeley, University of California Press.
- Glassman, J. (1999). "State Power beyond the 'Territorial Trap': The Internationalization of the State." Political Geography 18: 669-696.
- Glastra, R. (1999). Cut and Run: Illegal Logging and Timber Trade in the Tropics. Ottawa, International Development Research Center.
- Glesne, C. (1984). "The Impossibility of Doing Good." Culture and Agriculture 23: 1-6.
- Godoy, R., N. Brokaw, and D. Wilkie. (1995). "The Effect of Income on the Extraction of Non-Timber Tropical Forest Products: Model, Hypotheses, and Preliminary Findings from the Sumu Indians of Nicaragua." Human Ecology 23(1): 29-52.
- Godoy, R., N. Brokaw, D. Wilkie, G. Cruz, A. Cubas, J. Demmer, K. Mc Sweeney and J. Overman (1996). "Rates of return on investment in cattle among Amerindians of the rain forest of Honduras." Human Ecology 24(3): 395-399.
- Godoy, R., David Wilkie, and Jeffrey Franks (1997). "The Effects of Markets on Neotropical Deforestation: A Comparative Study of Four Amerindian Societies." Current Anthropology 38(5): 875-878.
- Godoy, R. A. (2001). Indians, Markets, and Rainforests: Theory, Methods, Analysis. New York, Columbia University Press.
- Goldman, M. (1998). Introduction: The Political Resurgence of the Commons. Privatizing Nature: Political Struggles for the Global Commons. M. Goldman. New Brunswick, Rutgers University Press: 1-19.

- Goldman, M. (2004). Imperial Science, Imperial Nature: Environmental Knowledge for the World (Bank). Earthly Politics: Local and Global in Environmental Governance. S. Jasanoff and M. L. Martello. Cambridge, MIT Press: 55-80.
- Gómez, O. and S. Vivas (1992). Análisis sobre Exportación de Madera Aserrada, 1991. Managua, IRENA.
- González, A. (1997). "Elections on the Atlantic Coast: Where Politics Moves on Slippery Turf." Envío 178-179: 31-41.
- González, A. (1997). "Esa participación que hace milagros." Envío 181: 19-25.
- González, A. (1997). "Municipalities: Where Democracy is Born." Envío April: 18-23.
- González Pérez, M. (1997). Gobiernos Pluriétnicos: La Constitución de Regiones Autónomas en Nicaragua. México, D.F., Plaza y Valdes Editores.
- Goodwin, P. (1998). "'Hired hands' or 'local voice': understandings and experience of local participation in conservation." Transactions of the Institute of British Geographers 23: 481-499.
- Gordon, E. T., G. C. Gurdián, et al. (2003). "Rights, Resources, and the Social Memory of Struggle: Reflections on a Study of Indigenous and Black Community Land Rights on Nicaragua's Atlantic Coast." Human Organization 62(4): 369-381.
- Gowdy, J. and S. O'hara (1995). Economic Theory for Environmentalists. Delray Beach, St. Lucie Press.
- GRAAN (1999). Diagnóstico Global de la Situación Agrosocioeconómico y Líneas Estratégicas para el Desarrollo de la Región Autónoma del Atlántico Norte. Bilwi, RAAN, Gobierno Regional Autónomo Atlántico Norte.
- Grant, R. and J. Nijman (2004). Globalization and the Hyperdifferentiation of Space in the Less Developed World. Globalization and Its Outcomes. J. O'Loughlin, L. Staeheli and E. Greenberg. New York, Guilford Press: 45-66.
- Greaves, A. (1978). Descriptions of seed sources and collections of provenances of *Pinus Caribaea*. Oxford, University of Oxford.
- Gretzinger, S. (2003). WWF, Central America: Lessons Learned from the Forestry Sector. First Forum on Lessons Learned from the Forestry Sector, June 3, 2003, Managua, MAGFOR-PROFOR-World Bank.

- Griffiths, T. (2000). Proyectos del Banco Mundial y los Pueblos Indígenas en Ecuador y Bolivia. Washington, D.C., Forest Peoples Program.
- Grillo, R. D. (1997). Discourses of Development: The View from Anthropology. Discourse of Development: Anthropological Perspectives. R. D. Grillo and R. L. Stirrat. Oxford, Berg: 1-33.
- Grillo, R. D. and R. L. Stirrat, Eds. (1997). Discourse of Development: Anthropological Perspectives. Oxford, Berg.
- Gulbrandsen, L. H. (2004). "Overlapping Public and Private Governance: Can Forest Certification Fill the Gaps in the Global Forest Regime?" Global Environmental Politics 4(2): 75-99.
- Gullison, R. E., R. E. Rice and A. G. Blundell (2000). "'Marketing' species conservation." Nature 404: 923-924.
- Gurdián, G. (2000). "Alamikangban: ¿identidad o fisonomía?" Wani 25: 36-51.
- Gurdián, G. C., C. R. Hale, and E. T. Gordon (2002). "Derechos, Recursos y Memoria Social de Lucha: Reflexiones Sobre un Estudio Acerca de los Derechos Territoriales de las Comunidades Indígena y Negras en la Costa Caribe de Nicaragua." Wani 29: 6-27.
- Gutner, T. L. (2002). Banking on the Environment: Multilateral Development Banks and their Environmental Performance in Central and Eastern Europe. Cambridge, MIT Press.
- Haas, P. M. (2004). Science policy for multilateral environmental governance. Emerging forces in environmental governance. N. Kanie and P. M. Haas. New York, United Nations University Press: 115-136.
- Haggett, P. (1964). "Regional and local components in the distribution of forested areas in southeast Brazil: A multivariate approach." Geographical Journal 130: 365-380.
- Hajer, M. A. (1995). The Politics of Environmental Discourse: Ecological Modernization and the Policy Process. Oxford, Clarendon Press.
- Hale, C. R. (1994). Resistance and Contradiction: Miskitu Indians and the Nicaraguan State, 1894-1987. Stanford, Stanford University Press.

- Hale, C. R., E. T. Gordon and G. Gurdíán (1998). Diagnóstico general sobre la tenencia de la tierra en las comunidades indígenas de la Costa Atlántica. Bluefields and Puerto Cabezas, Nicaragua, Central American and Caribbean Research Council.
- Hanna, S., C. Folke, K-G. Mäler, Eds. (1996). Rights to Nature: Ecological, Economic, Cultural, and Political Principles of Institutions for the Environment. Washington, D. C., Island Press.
- Hardin, G. (1968). "The Tragedy of the Commons." Science 152: 1243-1248.
- Harvey, D. (1968). "Pattern, Process, and the Scale Problem in Geographical Research." Transactions of the Institute of British Geographers XLV: 71-78.
- Harvey, D. (1982). The Limits to Capital. Oxford, Oxford University Press.
- Harvey, D. (1993). The Nature of Environment: The Dialectics of Social and Environmental Change. The Socialist Register. R. Miliband and L. Panitch: 1-51.
- Harvey, D. (2000). Spaces of Hope. Berkeley, University of California Press.
- Hassler, M. (2004). "Raw material procurement, industrial upgrading and labor recruitment: intermediaries in Indonesia's clothing industry." Geoforum 35: 441-451.
- Helms, M. W. (1971). Asang: Adaptions to Culture Contact in a Miskito Community. Gainesville, University of Florida Press.
- Hemley, G., Ed. (1994). International Wildlife Trade: A CITES Sourcebook. Washington, D.C., Island Press.
- Herb, G. H. (1999). National Identity and Territory. Nested Identities: Nationalism, Territory, and Scale. G. H. Herb and D. H. Kaplan. Boulder, Rowman and Littlefield Publishers: 9-30.
- Herlihy, P. H. (2001). Indigenous and Ladino Peoples of the Río Plátano Biosphere Reserve. Endangered Peoples of Latin America: Struggles to Survive and Thrive. S. C. Stonich. Westport, Greenwood Press: 100-120.
- Herlihy, P. H. and G. Knapp (2003). "Maps of, by, and for the Peoples of Latin America." Human Organization 62(4): 303-314.

- Herlihy, P. H. and A. P. Leake (1997). Participatory Research Mapping of Indigenous Lands in the Honduran Mosquitia. Demographic Diversity and Change in the Central American Isthmus. A. R. Pebley and L. Rosero-Bixby. Washington, D. C., Rand Books: 707-736.
- Herod, A. (1991). "The production of scale in United States labour relations." Area 23(1): 82-88.
- Herod, A. (2003). Scale: The Local and the Global. Key Concepts in Geography. S. L. Holloway, S. P. Rice and G. Valentine. London, Sage Publications: 229-247.
- Herod, A. and M. W. Wright (2002). Placing Scale: An Introduction. Geographies of Power: Placing Scale. A. Herod and M. W. Wright. Oxford, Blackwell Publishers: 1-14.
- Hobbs, R. J. (1998). Managing Ecological Systems and Processes. Ecological Scale: Theory and Applications. D. L. Peterson and V. T. Parker. New York, Columbia University Press: 399-483.
- Holling, C. S. and S. Sanderson (1996). Dynamics of (Dis)harmony in Ecological and Social Systems. Rights to Nature: Ecological, Economic, Cultural, and Political Principles of Institutions for the Environment. S. Hanna, C. Folke and K.-G. Mäler. Washington, D. C., Island Press: 57-85.
- Hopkins, T. K. and I. Wallerstein (1986). "Commodity chains in the world-economy prior to 1800." Review 10: 157-170.
- Horta, K. (2000). Biodiversity Conservation and the Political Economy of International Financial Institutions. Political Ecology: Science, Myth and Power. P. Scott and S. Sullivan. London, Arnold: 179-202.
- Howitt, R. (1993). "'A World in a Grain of Sand': Towards a Reconceptualisation of Geographical Scale." Australian Geographer 24(1): 33-44.
- Howitt, R. (1998). "Scale as relation: musical metaphors of geographical scale." Area 30(1): 49-58.
- Howitt, R. (2003). Scale. A Companion to Political Geography. J. Agnew, K. Mitchell and G. Toal. Malden, Blackwell: 138-157.
- Hughes, A. (2000). "Retailers, knowledges and changing commodity networks: the case of the cut flower trade." Geoforum 31: 175-190.

- Humphreys, D. (2003). "Life Protective or Carcinogenic Challenge? Global Forests Governance under Advanced Capitalism." Global Environmental Politics 3(2): 40-55.
- Humphreys, D. (2004). "Redefining the Issues: NGO Influence on International Forest Negotiations." Global Environmental Politics 4(2): 51-74.
- IDB (1997). Latin America after a Decade of Reforms. Washington, D.C., Inter-American Development Bank.
- Imhof, V. (9 de junio de 2003a). "Depurar el INAFOR". Managua, El Nuevo Diario. <http://www-ni.elnuevodiario.com.ni.archivo>. Accessed on 20 July 2003.
- Imhof, V. (30 de mayo de 2003b). Delegados INAFOR "son depredadores". Managua, El Nuevo Diario. <http://www-ni.elnuevodiario.com.ni.archivo>. Accessed on 14 July 2003.
- INAFOR (1999). Informe Anual - 1999, Dirección Técnica. Managua, Instituto Nacional Forestal.
- INAFOR (2001a). Censo Forestal Nacional. Managua, Instituto Nacional Forestal.
- INAFOR (2001b). Evaluación al Cumplimiento del Plan Operativo Forestal/98 (POF/98) por el Periodo Comprendido del 19 de Octubre del 1998 al 31 de Octubre del 2000. Managua, Instituto Nacional Forestal.
- INAFOR (2001c). Informe Preliminar del PRA-2000 al 11 de Agosto de 2001. Managua, Instituto Nacional Forestal.
- INDERA (1991). Diagnostico preliminar de los recursos forestales de las Regiones Autónomas del Atlántico. Managua, Instituto de Desarrollo de las Regiones Autónomas.
- INDUFOR (1993). Evaluación del Apoyo Sueco al Sector Forestal en Nicaragua, 1982-1992. Managua, Autoridad Sueca para el Desarrollo Internacional.
- INETER (1996). "Publicación Oficial de los Derroteros Municipales de la Republica de Nicaragua Anexo I de la Ley de Division Política Administrativa Regiones Autónomas Atlántico Norte y Atlántico Sur." La Gaceta 183: 4105-4119.
- INFONAC (1974). Forest Industries. Managua, Instituto de Fomento Nacional.
- INFONAC (n.d.). Proyecto Forestal del Noreste. Managua, Instituto de Fomento Nacional.

- IRENA (1983). Nicaragua: El Recurso Forestal y sus Proyecciones. Managua, Servicio Forestal Nacional.
- IRENA (1984). Estudio de Base Forestal: Plan de Trabajo 1985. Managua, Instituto Nicaraguense de Recurso Naturales y del Ambiente.
- IRENA (1986). Importancia del Sector Forestal y Plan Nacional de Desarrollo Forestal de Nicaragua. Managua, Instituto Nicaraguense de Recurso Naturales y del Ambiente.
- IUCN (2000). Indigenous and Traditional Peoples and Protected Areas: Principles, Guidelines and Case Studies. Gland, Switzerland, World Conservation Union.
- Jarquín, H. (9 de diciembre 2000). Litigio agrario en Prinzapolka. Managua, La Prensa. <http://www-ni.laprensa.com.ni/cronologico>. Accessed on 9 February 2000.
- Jarquín, H. (6 de febrero de 2001). Ex alcalde de Prinzapolka desapareció registros contables. Managua, La Prensa. <http://www-ni.laprensa.com.ni/cronologico>. Accessed on 9 February 2000.
- Jarquín, H. (22 de enero de 2003a). Renuncia el alcalde de Prinzapolka. Managua, La Prensa: 6B.
- Jarquín, H. (4 de julio de 2003b). Rechazan certificación a Prada. Managua, La Prensa: 9B.
- Jarquín, H. (13 de febrero de 2004). Logran acuerdos en Layasiksa. Managua, La Prensa. <http://www-ni.laprensa.com.ni/cronologico>. Accessed on 21 February 2004.
- Jenkins Molieri, J. (1986). El desafío indígena en Nicaragua: el caso del los miskitos. Managua, Editorial Vanguardia.
- Jessop, B. (1990). State theory. Cambridge, Polity.
- Jessop, B. (1997). "Capitalism and its future: remarks on regulation, government and governance." Review of International Political Economy 4: 561-581.
- Jonas, A. E. G. (1994). "Editorial: The Scale Politics of Spatiality." Environment and Planning D: Society and Space 12: 257-264.
- Kaiser, J. (2001). "Bold Corridor Project Confronts Political Reality." Science 293(5538): 2196-2199.

- Keck, M. E. and K. Sikkink (1998). Activists beyond Borders: Advocacy Networks in International Politics. Ithaca, Cornell University Press.
- Keeling, David, J. (2004). Latin American Development and the Globalization Imperative: New Directions, Familiar Crises. Journal of Latin American Geography 3(1): 1-21.
- Kelly, P. F. (1997). "Globalization, Power and the Politics of Scale in the Philippines." Geoforum 28(2): 151-171.
- Kelly, P. F. (1999). "The Geographies and Politics of Globalization." Progress in Human Geography 23(3): 379-400.
- Khare, A. and D. B. Bray (2004). Study of Critical New Forest Conservation Issues in the Global South. Ford Foundation.
- Klooster, D. (2000). "Institutional Choice, Community and Struggle: A Case Study of Forest Co-Management in Mexico." World Development 28(1): 1-20.
- Knapp, G. (1991). Andean Ecology: Adaptive Dynamics in Ecuador. Boulder, Westview Press.
- Knapp, G. and P. Herlihy (2002). Mapping the Landscape of Identity. Latin America in the 21st Century: Challenges and Solutions. G. Knapp. Austin, University of Texas Press: 251-268.
- Kremen, C., A. M. Merenlender and D. D. Murphy (1994). "Ecological Monitoring: A Vital Need for Integrated Conservation and Development Programs in the Tropics." Conservation Biology 8(2): 388-397.
- Kurtz, H., E. (2003). "Scale frames and counter-scale frames: constructing the problem of environmental injustice." Political Geography 22: 887-916.
- Laguna Benavidez, D. (2000). Corredor Biológico Mesoamericano. Managua, El Nuevo Diario. <http://www-ni.elnuevodiario.com.ni.archivo>. Accessed on 9 June 2001.
- Lamb, F. B. (1948). "Status of Forestry in Tropical America." Journal of Forestry 46(10): 721-726.
- Lamb, F. B. (1966). Mahogany of Tropical America: Its Ecology and Management. Ann Arbor, University of Michigan Press.
- Larson, A. M. (2002). "Natural Resources and Decentralization in Nicaragua: Are Local Governments Up to the Job?" World Development 30(1): 17-31.

- Larson, A. M. and J. C. Ribot (2004). "Democratic Decentralization through a Natural Resource Lens: An Introduction." The European Journal of Development Research 16(1): 1-25.
- Larson, P. S., M. Freudenberger and B. Wyckoff-Baird. (1998). WWF Integrated Conservation and Development Projects: Ten Lessons from the Field 1985-1996. Washington, D. C., World Wildlife Fund.
- Latham, A. (2002). Rethorizing the Scale of Globalization: Topologies, Actor-Networks, and Cosmopolitanism. Geographies of Power: Placing Scale. A. Herod and M. W. Wright. Oxford, Blackwell Publishers: 115-144.
- Latour, B. (1993). We have never been modern. Brighton, Harvester Wheatsheaf.
- Latour, B. (1999). On Recalling ANT. Actor Network and After. J. Law and J. Hassard. Oxford, Blackwell and the Sociological Review: 15-25.
- Le Prestre, P. G. (1995). Environmental Learning at the World Bank. International Organizations and Environmental Policy. R. V. Bartlett, A. K. Priya and M. Madhu. Westport, Greenwood Press: 83-101.
- Leitner, H. (2004). The Politics of Scale and Networks of Spatial Connectivity: Transnational Interurban Networks and the Re-scaling of Political Governance in Europe. Scale and Geographic Inquiry: Nature, Society, and Method. E. Shepard and R. B. McMaster. Malden, Blackwell: 236-255.
- Leitner, H., C. Pavlik and E. Shepard. (2002). Networks, Governance, and the Politics of Scale: Inter-urban Networks and the European Union. Geographies of Power: Placing Scale. A. Herod and M. W. Wright. Oxford, Blackwell Publishers: 274-303.
- Lijphart, A. (1975). "The Comparable Cases Strategy in Comparative Research." Comparative Political Studies 8(2): 158-177.
- Limi-Nawâh Corporation (2004). The Evolution of a Political Giant: The Consejo Territorial Prinzapolka-Bambana. <http://www.limi-nawah.com/archive.htm#June23>. Accessed 13 October 2004.
- Lindenmayer, D. B. and J. F. Franklin (2002). Conserving Forest Biodiversity: A Comprehensive Multiscaled Approach. Washington, Island Press.
- Litfin, K. T. (1994). Ozone Discourses: Science and Politics in Global Environmental Cooperation. New York, Columbia University Press.

- Loáisiga Mayorga, J. (2003). INAFOR impulsa plan contra madereros inescrupulosos. Managua, La Prensa. 6A.
- López, F. (8 de febrero de 1999). Intentan despojar tierras a miskitos. Managua, El Nuevo Diario. <http://www-ni.elnuevodiario.com.ni/archivo>. Accessed on 25 February 2000.
- López, M. A. (2003). INAFOR en la mira. Managua, La Prensa. 12A.
- Lutz, E. (2004). "Measuring the Success of the International Decade." Cultural Survival Quarterly 28(3): 5-6.
- MacDonald, T. (1988). The Moral Economy of the Miskito Indians: Local Roots of Geopolitical Conflict. Ethnicities and Nations: Processes of Interethnic Relations in Latin America, Southeast Asia and the Pacific. R. Guidieri, F. Pellizzi and S. J. Tambiah. Austin, University of Texas Press: 107-153.
- MacKay, F. and E. Caruso (2004). "Indigenous Lands or National Parks?" Cultural Survival Quarterly Spring: 14-16.
- Maini, J. S. (2003). International Dialogue on Forests: Impact on National Policies and Practices. Forest Policy for Private Forestry: Global and Regional Challenges. L. Teeter, B. Cashore and D. Zhang. New York, CABI Publishing: 9-16.
- Makua International, S. A. (n.d.). Proyecto de Desarrollo Económico Sostenible para el Area de Prinzapolka. Managua.
- Malefant, D. (1993). Estudio de la zona de Alamikamba. Perspectivas para el desarrollo del Proyecto CMG & BSF. Managua, DANIDA.
- Mallona, M. A., J. Vandermeer, G. Urquhard and I. G. de la Cerda (n.d.). Introducción a los Árboles y Palmas Arborescentes de la Región Autónoma del Atlántico Sur de Nicaragua. Managua, Centro de Investigación y Documentación de la Costa Atlántica.
- Mander, J. (2003). Intrinsic Negative Effects of Economic Globalization on the Environment. Worlds Apart: Globalization and the Environment. J. G. Speth. Washington D.C., Island Press: 108-129.
- Mankin, W. E. (1998). Entering the Fray: International forest policy processes: an NGO perspective on their effectiveness. London, International Institute for Environment and Development.

- Mann, M. (2003). Capitalism and the Dis-empowerment of Canadian Aboriginal Peoples. Natural Resources and Aboriginal People in Canada: Readings, Cases, and Commentary. R. B. Anderson and R. M. Bone. Concord, Ontario, Captus: 18-29.
- MARENA-DANIDA, Ed. (1994). Pinos de Nicaragua. Managua.
- MARENA (1998). Concesión Forestal ha quedado sin efecto y valor alguno, MN-RSV-02-0113.98. Carta del Ministerio de Recursos Naturales y Ambiente a la empresa Sol del Caribe, Managua.
- Margoluis, R., C. Margoluis, K. Brandon and N. Salafsky (2000). Good Company: Effective Alliances for Conservation. Washington, D.C., World Wildlife Fund.
- Markopoulos, M. D. (2003). The Role of Certification in Community-based Forestry Enterprise. Social and Political Dimensions of Forest Certification. E. Meidinger, C. Elliott and G. Oesten. Remagen-Oberwinter, Germany, www.forstbuch.de: 105-131.
- Marston, S. A. (2000). "The social construction of scale." Progress in Human Geography 24(2): 219-242.
- Martínez, M. (9 de febrero de 2004). Las semillas de violencia en Layasiksa. Managua, La Prensa. <http://www.laprensa.com.ni/cronologico>. Accessed on 9 February 2004.
- Mather, C. (1999). "Agro-commodity chains, market power and territory: re-regulating South African citrus exports in the 1990s." Geoforum 30: 61-70.
- MBC (2002). The Mesoamerican Biological Corridor: A Platform for Sustainable Development. Managua, CCAD-UNDP/GEF.
- McAfee, K. (1999). "Selling nature to save it? Biodiversity and green developmentalism." Environment and Planning D: Society and Space 17: 133-154.
- McCarty, H. H., J. C. Hook and D. S. Knos (1956). "The measurement of association in industrial geography." University of Iowa Department of Geography Reports 1: 1-143.
- McCay, B. J. (2000). "Post-modernism and the Management of Natural and Common Resources." The Common Property Resource Digest 54: 1-8.
- McCay, B. J. and S. Jentoft (1998). "Market or Community Failure? Critical Perspectives on Common Property Research." Human Organization 57(1): 21-29.

- McDowell, L. (2001). "Linking Scales: Or How Research about Gender and Organizations Raises New Issues for Economic Geography." Journal of Economic Geography 1: 227-250.
- McKean, M. and E. Ostrom (1995). "Common property regimes in the forest: just a relic from the past?" Unasylva 180(46): 3-15.
- McKean, M. A. (1996). Common-Property Regimes as a Solution to Problems of Scale and Linkage. Rights to Nature: Ecological, Economic, Cultural, and Political Principles of Institutions for the Environment. S. Hanna, C. Folke and K.-G. Mäler. Washington, D. C., Island Press: 223-243.
- McMaster, R. B. and E. Sheppard (2004). Introduction: Scale and Geographic Inquiry. Scale and Geographic Inquiry: Nature, Society, and Method. E. Sheppard and R. B. McMaster. Malden, Blackwell: 1-22.
- McSweeney, K. (2004). "The Dugout Canoe Trade in Central America's Mosquitia: Approaching Rural Livelihoods through Systems of Exchange." Annals of the Association of American Geographers 94(3): 638-661.
- Meentemeyer, V. (1989). "Geographical perspectives of space, time, and scale." Landscape Ecology 3(3/4): 163-173.
- MEIC (1973). Análisis del Sub Sector Forestal de Nicaragua. Managua, Ministerio de Economía, Industria y Comercio.
- Meyer, W. B., D. Gregory, B. L. Turner II and P. F. McDowell (1992). The Local-Global Continuum. Geography's Inner Worlds. R. F. Abler and M. G. Marcus. New Brunswick, Rutgers University Press: 255-279.
- Miller, B. (1994). "Political empowerment, local-central state relations, and geographically shifting political opportunity structures." Political Geography 13(5): 393-406.
- Miller, B. (1997). "Political action and the geography of defense investment: geographical scale and the representation of the Massachusetts Miracle." Political Geography 16(2): 171-185.
- Miller, K., E. Chang and N. Johnson (2001). Defining Common Ground for the Mesoamerican Biological Corridor. Washington, D.C., World Resources Institute.
- Miller, K. R. (1996). Balancing the Scales: Guidelines for Increasing Biodiversity's Chances Through Bioregional Management. New York, World Resources Institute.

- Mitchell, D. (1996). Granting of natural resource concessions causes scandal. Nicaragua News Service. 4: 1-2.
- Mitchell, M. (1996). From Talking Chiefs to a Native Corporate Elite: The Birth of Class and Nationalism among Canadian Inuit. Montreal, McGill-Queen's University Press.
- Moore, D. S. (1993). "Contesting Terrain in Zimbabwe's Eastern Highlands: Political Ecology, Ethnography, and Peasant Resource Struggles." Economic Geography 69(4): 380-401.
- Moore, D. S. (1996). Marxism, Culture, and Political Ecology: Environmental struggles in Zimbabwe's Eastern Highlands. Liberation Ecologies: Environment, Development, Social Movements. R. Peet and M. Watts. New York, Routledge: 125-147.
- Morrill, R. (1999). "Inequalities of power, costs, and benefits across geographic scales: the future uses of the Hanford reservation." Political Geography 18: 1-12.
- Morris, A. (1992). Decentralization: The Context. Decentralization in Latin America: An Evaluation. A. Morris and S. Lowder. New York, Prager: 1-12.
- Morrow, C. E. and R. W. Hull (1996). "Donor-Initiated Common Pool Resource Institutions: The Case of the Yanesha Forestry Cooperative." World Development 24(10): 1641-1657.
- Mosse, D. (1997). "The Symbolic Making of a Common Property Resource: History, Ecology and Locality in a Tank-irrigated Landscape in South Asia." Development and Change 28: 467-504.
- Murdoch, J. (1997). "Towards a geography of heterogeneous associations." Progress in Human Geography 21: 321-337.
- Nadasdy, P. (2003). The Politics of TEK: Power and the 'Integration' of Knowledge. Natural Resources and Aboriginal People in Canada: Readings, Cases, and Commentary. R. B. Anderson and R. M. Bone. Concord, Ontario, Captus: 79-103.
- Najam, A. (2002). "Financing Sustainable Development." Progress in Development Studies 2(2): 153-160.
- Najam, A., I. Christopoulou, et al. (2004). "The Emergent "System" of Global Environmental Governance." Global Environmental Politics 4(4): 23-35.

- National Research Council, Ed. (2002). The Drama of the Commons. Washington, D.C., National Academy Press.
- Nayak, P. K. (2003). Communities, Forests and Conflicts: Experiences from Community Forest Management in Orissa. New Delhi, Ford Foundation.
- Naylor, R. A. (1989). Penny Ante Imperialism: The Mosquito Shore and the Bay of Honduras, 1600-1914: A Case Study in British Informal Empire. Toronto, Associated University Presses.
- Netting, R. M. (1993). Smallholders, Householders: Farm Families and the Ecology of Intensive, Sustainable Agriculture. Stanford, Stanford University Press.
- Newhouse, D. (2003). Modern Aboriginal Economics: Capitalism with a Red Face. Natural Resources and Aboriginal People in Canada: Readings, Cases, and Commentary. R. B. Anderson and R. M. Bone. Concord, Ontario, Captus: 70-78.
- Newson, L. A. (1987). Indian survival in colonial Nicaragua. Norman, University of Oklahoma Press.
- Newstead, C., C. K. Reid and M. Sparke (2003). The Cultural Geography of Scale. Handbook of Cultural Geography. K. Anderson. Thousand Oaks, Sage: 485-497.
- Nietschmann, B. Q. (1973). Between Land and Water: The Subsistence Ecology of the Miskito Indians, Eastern Nicaragua. New York, Seminar Press.
- Nietschmann, B. Q. (1991). "Miskito Coast Protected Area." National Geographic Research and Exploration 7(2): 232-234.
- Nietschmann, B. Q. (1993). The Conservation of Biological and Cultural Diversity. Annual Meeting of the Association of American Geographers, Atlanta, GA.
- Nietschmann, B. Q. (1995). "Defending the Miskito Reef with Maps and GPS." Cultural Survival Quarterly Winter: 34-37.
- Nietschmann, B. Q. (1997). Protecting Indigenous Coral Reefs and Sea Territories, Miskito Coast, RAAN, Nicaragua. Conservation Through Cultural Survival: Indigenous Peoples and Protected Areas. S. Stevens. Washington, D.C., Island Press: 193-224.
- Noss, R. F. (1991). Landscape connectivity: Different functions at different scales. Landscape Linkages and Biodiversity. W. E. Hudson. Washington, D. C., Island Press: 27-39.

- Nygren, A. (2004). "Competing Claims on Disputed Lands: The Complexity of Resource Tenure in the Nicaraguan Interior." Latin American Research Review 39(1): 123-153.
- Offen, K. (1999). The Miskitu Kingdom. Landscape and the Emergence of a Miskitu Ethnic Identity, Northeastern Nicaragua and Honduras, 1600-1800. Unpublished Ph. D. Dissertation, Geography. Austin, Texas, University of Texas.
- Offen, K. (2004). "Historical Political Ecology: An Introduction." Historical Geography 32: 19-42.
- Offen, K. H. (2003). "Narrating Place and Identity, or Mapping Miskitu Land Claims in Northeastern Nicaragua." Human Organization 62(4): 382-392.
- Olson, D. M. and E. Dinerstein (2002). "The Global 200: Priority Ecoregions for Global Conservation." Annals of the Missouri Botanical Garden 89: 199-224.
- Olson Jr., M. (1998). Group Size and Group Behavior. Managing the Commons. J. A. Baden and D. S. Noonan. Bloomington, Indiana University Press: 39-50.
- Operations Evaluation Department (1991). Forestry: The World Bank's Experience. Washington, D. C., The World Bank.
- OPHDESCA (1992). Caracterización del Territorio de Río Prinzapolka y Cartera de Proyectos. Región Autónoma Atlántico Norte, Nicaragua, Fundación Oficina de Promoción Humanitaria y Desarrollo de la Costa Atlántica.
- Oporta, D. and L. López (2000). Plan General de Manejo Forestal "San Martín". Managua, Hermanos Úbeda.
- Ortega Blandon, V. M. (1966). Legislación Forestal en Nicaragua Criticas y Sugerencias. Unpublished graduate thesis, Agronomía. Managua, Escuela Nacional de Agricultura y Ganadería.
- Ortega Hegg, M. (1994). "Problemática étnica, región y autonomía." Boletín de Antropología Americana 30: 5-20.
- Ortega Hegg, M. (1998). La Descentralización en Centroamérica. IV Congreso de Historia, Universidad Thomas More, Managua.
- Ortega Hegg, M. (February 16, 2002). Interview with author. Managua, University of Central America.

- Ostrom, E. (1987). Institutional Arrangements for Resolving the Commons Dilemma: Some Contending Approaches. The Question of the Commons: The Culture and Ecology of Communal Resources. B. J. McCay and J. M. Acheson. Tucson, University of Arizona Press: 250-265.
- Ostrom, E. (1990). Governing the Commons: The Evolution of Institutions for Collective Action. New York, Cambridge University Press.
- Ostrom, E. (1995). Designing Complexity to Govern Complexity. Property Rights and the Environment: Social and Ecological Issues. S. Hanna and M. Munasinghe. Washington, D.C., The Beijer International Institute of Ecological Economics and The World Bank: 33-45.
- Ostrom, E., J. Burger, C. B. Field, R. B. Norgaard and D. Policansky (1999). "Revisiting the Commons: Local Lessons, Global Challenges." Science 284(5412): 278-282.
- Paasi, A. (2004). "Place and region: looking through the prism of scale." Progress in Human Geography 28(4): 536-546.
- Parsons, J. J. (1955). "The Miskito Pine Savanna of Nicaragua and Honduras." Annals of the American Association of Political and Social Science XLV(1): 36-63.
- Paulson, S., L. L. Gezon and M. Watts (2004). Politics, Ecologies, Genealogies. Political Ecology across Spaces, Scales, and Social Groups. S. Paulson and L. L. Gezon. New Brunswick, Rutgers University Press: 17-40.
- Pearse, P. H. (1998). Economic Instruments for Promoting Sustainable Forestry: Opportunities and Constraints. The Wealth of Forests: Markets, Regulation, and Sustainable Forestry. C. Tollefson. Vancouver, UBC Press: 19-41.
- Peck, J. (2002). "Political Economics of Scale: Fast Policy, Interscalar Relations, and Neoliberal Workfare." Economic Geography 78(3): 331-360.
- Peck, J. and A. Tickell (1995). "The social regulation of uneven development: 'regulatory deficit', England's south-east and the collapse of Thatcherism." Environment and Planning A 27: 15-40.
- Peet, R. and M. Watts, Eds. (1996). Liberation Ecologies: Environment, Development, Social Movements. New York, Routledge.
- Peluso, N. L. (1992). "The Political Ecology of Extraction and Extractive Resources in East Kalimantan, Indonesia." Development and Change 23(4): 49-74.

- Peluso, N. L. (1994). Rich Forests, Poor People: Resource Control and Resistance in Java. Berkeley, University of California Press.
- Peluso, N. L. (1999). The Role of Forests in Sustaining Smallholders. Forests to Fight Poverty: Creating National Strategies. R. Schmidt, J. K. Berry and J. C. Gordon. New Haven, Yale University: 38-64.
- Perera, J. F. and M. Á. Musálem (2003). "Botánica y Ecología del *Pino Caribaea*, variedad *hondurensis*." Wani 33: 49-69.
- Perkins, P. E. (1998). Sustainable trade: theoretical approaches. Political Ecology: Global and local. R. Keil, D. V. J. Bell, P. Penz and L. Fawcett. London, Routledge: 46-67.
- Perreault, T. (2003). "Changing places: transnational networks, ethnic politics, and community development in the Ecuadorian Amazon." Political Geography 22: 61-88.
- Perreault, T. and P. Martin (2005). "Geographies of neoliberalism in Latin America." Environment and Planning A 37: 191-201.
- Pimbert, M. P. and J. N. Pretty (1997). Parks, People and Professionals: Putting 'Participation' into Protected-area Management. Social Change and Conservation: Environmental Politics and Impacts of National Parks and Protected Areas. K. B. Ghimire and M. Pimbert. London, Earthscan: 297-330.
- Plant, R. and S. Hvalkof (2001). Land Titling and Indigenous Peoples. Washington, D.C., Inter-American Development Bank.
- Preston, J. (1996). It's Indians vs. loggers in Nicaragua. The New York Times. New York: A8.
- Proarca/Costas (1997). Perfil de los Asuntos de Manejo de las Lagunas de Karatá y Wouhta en la Zona Costera de la Región Autónoma del Atlántico Norte de Nicaragua. Bilwi, Proyecto Ambiental Regional para Centroamerica.
- Prugh, T., R. Costanza, et al. (2000). The Local Politics of Global Sustainability. Washington, D.C., Island Press.
- Purcell, M. (2003). "Islands of practice and the Marston/Brenner debate: toward a more synthetic critical human geography." Progress in Human Geography 27(3): 317-332.

- Ragin, C. C. (1987). The Comparative Method: Moving Beyond Qualitative and Quantitative Strategies. Berkeley, University of California Press.
- Rametsteiner, E. and M. Simula (2003). "Forest certification--an instrument to promote sustainable forest management?" Journal of Environmental Management 67: 87-98.
- Ramos, A. R. (1998). Indigenism: Ethnic Politics in Brazil. Madison, University of Wisconsin Press.
- Randel, J., T. German, et al., Eds. (2000). The Reality of Aid 2000: An Independent Review of Poverty Reduction and Development Assistance. London, Earthscan.
- Redford, K. H. and S. E. Sanderson (2000). "Extracting Humans from Nature." Conservation Biology 14(5): 1362-1364.
- Ribot, J. C. (2004). Waiting for Democracy: The Politics of Choice in Natural Resource Decentralization. Washington, D. C., World Resources Institute.
- Rich, B. (1994). Mortgaging the Earth: The World Bank, Environmental Impoverishment, and the Crisis of Development. Boston, Beacon Press.
- Richards, M. (1997). "Common Property Resource Institutions and Forest Management in Latin America." Development and Change 28: 95-117.
- Richards, M. (1999). 'Internalising the Externalities' of Tropical Forestry: A Review of Innovative Financing and Incentive Mechanisms. London, Overseas Development Institute.
- Rivera, V., Dennis Williamson, and Mario Rizo (1996). Autonomía y Sociedad en la RAAN. Managua, Centro de Investigaciones y Documentación de la Costa Atlántica de Nicaragua.
- Robbins, P. (2003). "Political Ecology in Political Geography." Political Geography 22: 641-645.
- Robbins, P. (2004). Political Ecology: A Critical Introduction. Malden, MA, Blackwell Publishing.
- Rocheleau, D. (1995). "Gender and Biodiversity: A Feminist Political Ecology Perspective." IDS bulletin 26(1): 9-16.
- Rocheleau, D. and L. Ross (1995). "Trees as Tools, Tree as Text: Struggles Over Resources in Zambrana-Chacuey, Dominican Republic." Antipode 27(4): 407-428.

- Rocheleau, D., B. Thomas-Slayter and E. Wangari, Eds. (1996). Feminist Political Ecology: Global Issues and Local Experiences. New York, Routledge.
- Rodan, B. D. and A. G. Blundell (2003). "Can Sustainable Mahogany Stem from CITES Science?" BioScience 53(7): 619.
- Roe, E. (1999). Except Africa: Remaking Development, Rethinking Power. New Brunswick, Transaction Publishers.
- Roldan, H. (2001). Recursos Forestales y Cambio en el Uso de la Tierra, República de Nicaragua. Santiago, FAO.
- Roldán Ortega, R. (2000). Legalidad y Derechos Etnicos en la Costa Atlántica de Nicaragua. Colombia, RAAN-ASDI-RAAS.
- Romero Vargas, G. (1995). Las Sociedades del Atlántico de Nicaragua en los Siglos XVII y XVIII. Managua, Fondo de Promoción Cultural, Banco Nicaragüense.
- Rondinelli, D. A. and J. R. Nellis (1986). "Assessing Decentralization Policies in Developing Countries: The Case for Cautious Optimism." Development Policy Review(4): 3-23.
- Ruiz Poveda, J. R. (1995). Compilación y Comentario a la Legislación sobre Recursos Forestales. Escuela de Derecho. Managua, Universidad Centro Americana.
- Saenz, R. and A. Morales (1997). Decretos y Leyes Forestales de Nicaragua. Managua, Banco Mundial.
- Salafsky, K. and E. Wollenberg (2000). "Linking Livelihoods and Conservation: A Conceptual Framework and Scale for Assessing the Integration of Human Needs and Biodiversity." World Development 28(8): 1421-1438.
- Sawchuk, J. (1998). The Dynamics of Native Politics: The Alberta Metis Experience. Saskatoon, Purich Publishing.
- Schelhas, J. (2003). New Trends in Forest Policy and Management: an Emerging Postmodern Approach. Forest Policy for Private Forestry: Global and Regional Challenges. L. Teeter, B. Cashore and D. Zhang. New York, CABI Publishing: 17-27.
- Schelhas, J. and R. Greenberg (1996). Introduction: The Value of Forest Patches. Forest Patches in Tropical Landscapes. J. Schelhas and R. Greenberg. Washington, D. C., Island Press: xv-xxxvi.

- Schroeder, R. (1999). Shady Practices: Agroforestry and Gender Practices in The Gambia. Berkeley, University of California Press.
- Schroeder, R. A. (1995). "Contradictions Along the Commodity Road to Environmental Stabilization: Foresting Gambian Gardens." Antipode 27(4): 325-342.
- SCS (2001). Resumen Público de la Certificación Hermanos Úbeda #SCS-FM/COC-00032P, Scientific Certification Systems.
http://www.scs1.com/PDFS/forest_ubeda_span.pdf. Accessed on 20 January 2003.
- Serfores, S. A. (2000). Plan General de Manejo "Tungla". Prinzapolka, Nicaragua, Comunidad de Tungla.
- Seymour, F. J. and N. K. Dubash (2000). The Right Conditions: The World Bank, Structural Adjustment and Forest Policy Reform. Washington, D. C., World Resources Institute.
- Sheppard, E. and R. B. McMaster, Eds. (2004). Scale and Geographic Inquiry: Nature, Society, and Method. Malden, Blackwell.
- Shión, M. and R. Ambrogi (1997). Políticas Forestales en Nicaragua. Políticas Forestales en Centro América: Análisis de las Restricciones para el Desarrollo del Sector Forestal. O. Segura, D. Kaimowitz and J. Rodriguez. San Salvador, IICA-Holanda/Laderas: 147-178.
- Shiva, V. (2003). The Myths of Globalization Exposed: Advancing Toward a Living Democracy. Worlds Apart: Globalization and the Environment. J. G. Speth. Washington, Island Press: 141-154.
- Sierra, R. and J. Stallings (1998). "The Dynamics and Social Organization of Tropical Deforestation in Northwest Ecuador, 1983-1995." Human Ecology 26(1): 135-161.
- Sierra, R., F. Rodriguez and E. Losos (1999). "Forest resource use change during early market integration in tropical rain forests: the Huaorani of upper Amazonia." Ecological Economics 30: 107-119.
- Silvern, S. E. (1999). "Scales of Justice: Law, American Indian Treaty Rights and the Political Construction of Scale." Political Geography 18: 639-668.
- Simberloff, D., J. A. Farr, J. Cox and D. W. Mehlmen (1992). "Movement Corridors: Conservation Bargains or Poor Investments." Conservation Biology 6(4): 493-504.

- Simonsen, K. (2004). "Commentaries: Networks, flows, and fluids--reimaging spatial analysis." Environment and Planning A 36: 1333-1340.
- Singleton, S. and M. Taylor (1992). "Common-pool, Collective Action and Community." Journal of Theoretical Politics 4(3): 309-324.
- SmartWood (2003). Resumen Público de Certificación de Prada, S.A., El Cascal-Layasiksa, SW-FM/COC-271. New York, Rainforest Alliance.
- Smith, M. P. (1998). "Looking for the global spaces in local politics." Political Geography 17(1): 34-40.
- Smith, N. (1984). Uneven Development: Nature, Capital and the Production of Space. Oxford, Blackwell Publishers.
- Smith, N. (1992). Geography, Difference and the Politics of Scale. Postmodernism and the Social Sciences. J. Doherty and E. Graham. New York, St. Martin's Press: 57-79.
- Smith, N. (1993). Homeless/global: Scaling places. Mapping the Futures: Local cultures, global change. J. Bird, B. Curtis, T. Putnam, G. Robertson and L. Tickner. New York, Routledge: 87-119.
- Smith, N. (1995). Remaking Scale: Competition and Cooperation in Prenational and Postnational Europe. Competitive European Peripheries. Berlin, Springer-Verlag: 59-74.
- Smith, N. and W. Dennis (1987). "The Restructuring of Geographical Scale: Coalescence and Fragmentation of the Northern Cone Region." Economic Geography 63(2): 160-182.
- Smith, N. and C. Katz (1993). Grounding metaphor: towards a spatialized politics. Place and the Politics of Identity. M. Keith and S. Pile. London, Routledge: 67-84.
- Snook, L. K. (1996). "Catastrophic Disturbance, Logging and the Ecology of Management of Mahogany (*Swietenia macrophylla* King): Grounds for Listing a Major Tropical Species in CITES." Botanical Journal of the Linnean Society 122(1): 35-46.
- Sollis, P. (1989). "The Atlantic Coast of Nicaragua: Development and Autonomy." Journal of Latin American Studies 21: 481-520.
- Speth, J. G. (2003). Two Perspectives on Globalization and the Environment. Worlds Apart: Globalization and the Environment. J. G. Speth. Washington D.C., Island Press: 1-18.

- Spies, T. A. and M. G. Turner (1999). Dynamic forest mosaics. Maintaining biodiversity in forest ecosystems. J. M. Hunter. Cambridge, Cambridge University Press: 95-160.
- Stanley, D. L. (1991). "Communal Forest Management: The Honduran Resin Tappers." Development and Change 22: 757-779.
- Stevens, S. (1997). Lessons and Directions. Conservation through Cultural Survival: Indigenous Peoples and Protected Areas. S. Stevens. Washington, D.C., Island Press: 263-298.
- Stone, K. H. (1972). "A Geographer's Strength: The Multiple-Scale Approach." Journal of Geography 71(6): 354-362.
- Styles, B. T. (1994). El Género Pinus en Nicaragua. Pinos de Nicaragua. Managua, MARENA-DANIDA: 4-16.
- Sundberg, J. (1998a). "NGO Landscapes in the Maya Biosphere Reserve, Guatemala." The Geographical Review. 88(3): 388-412.
- Sundberg, J. (1998b). "Strategies for Authenticity, Space, and Place in the Maya Biosphere Reserve, Petén, Guatemala." Conference of Latin American Geographers 24: 85-96.
- Sundberg, J. (2003a). "Conservation and democratization: constituting citizenship in the Maya Biosphere Reserve, Guatemala." Political Geography 22: 715-740.
- Sundberg, J. (2003b). Strategies for Authenticity and Space in the Maya Biosphere Reserve, Petén, Guatemala. Political Ecology: An Integrative Approach to Geography and Environment-Development Studies. K. S. Zimmerer and T. J. Bassett. New York, Guilford: 50-69.
- Swyngedouw, E. (1997a). Excluding the Other: The Production of Scale and Scaled Politics. Geographies of Economies. R. Lee and J. Wills. New York, Arnold: 167-176.
- Swyngedouw, E. (1997b). Neither Global nor Local: 'Glocalization' and the Politics of Scale. Spaces of Globalization: Reasserting the Power of the Local. K. R. Cox. New York, Guilford: 137-166.
- Swyngedouw, E. (2000). "Authoritarian governance, power, and the politics of re-scaling." Environment and Planning D: Society and Space 18: 63-76.

- Swyngedouw, E. (2004). Scaled Geographies: Nature, Place, and the Politics of Scale. Scale and Geographic Inquiry: Nature, Society, and Method. E. Sheppard and R. B. McMaster. Malden, Blackwell: 129-153.
- Talbot, J. M. (1997). "The Struggle for Control of a Commodity Chain: Instant Coffee from Latin America." Latin American Research Review 32(2): 117-135.
- Tarasofsky, R. G. (1999). Assessing the International Forest Regime: Gaps, Overlaps, Uncertainties and Opportunities. Assessing the International Forest Regime. R. G. Tarasofsky. Cambridge, The World Conservation Union: 3-12.
- Tarasofsky, R. G. and D. R. Downes (1999). Global Cooperation of Forests through International Institutions. Assessing the International Forest Regime. R. G. Tarasofsky. Cambridge, The World Conservation Union: 97-110.
- Tarrifa, R. (2003). World Bank: Lessons Learned from the Forestry Sector. First Forum on Lessons Learned from the Forestry Sector, June 3, 2003, Managua, MAGFOR-PROFOR-World Bank.
- Taylor, B. W. (1963). "An Outline of the Vegetation of Nicaragua." Journal of Ecology 51: 27-54.
- Taylor, E. (2000). Experiencias de Aprovechamiento Forestal en la RAAN, Nicaragua. IV Congreso Forestal Centroamericano, Montelimar, Nicaragua.
- Taylor, P. J. (1981). "Geographical Scales within the World-Economy Approach." Review 1: 3-11.
- Taylor, P. J. (1982). "A materialist framework for political geography." Transactions of the Institute of British Geographers 7(1): 15-34.
- Taylor, P. J. (2004). Is There a Europe of Cities? World Cities and the Limitations of Geographical Scale Analyses. Scale and Geographic Inquiry: Nature, Society, and Method. E. Sheppard and R. B. McMaster. Malden, Blackwell: 213-235.
- Taylor, P. J. and F. H. Buttel (1992). "How do we Know we have Global Environmental Problems? Science and the Globalization of Environmental Discourse." Geoforum 23(3): 405-416.
- Taylor, T. (2003). Plan General de Manejo Forestal, "La Pista". Comunidad de Alamikangban, Prinzapolka, RAAN, Draft.
- Tercero, V. (2003). PROFOR: Lessons Learned from the Forestry Sector. First Forum on Lessons Learned from the Forestry Sector, June 3, 2003, Managua, MAGFOR-PROFOR-World Bank.

- Thornber, K. (2003). Certification: A Discussion of Equity Issues. Social and Political Dimensions of Forest Certification. E. Meidinger, C. Elliott and G. Oesten. Remagen-Oberwinter, Germany, www.forstbuch.de: 63-82.
- Thorne, E. T. (2004). "Multilateral Development Banks and the Challenge of Reform." Global Environmental Politics 4(3): 160-167.
- Tollefson, C., Ed. (1998). The Wealth of Forests: Markets, Regulation, and Sustainable Forestry. Vancouver, UBC Press.
- Towers, G. (2000). "Applying the Political Geography of Scale: Grassroots Strategies and Environmental Justice." Professional Geographer 52(1): 23-36.
- Traffic (2001a). Big-Leafed Mahogany and CITES. <http://www.traffic.org/mahogany/>. Accessed on 11 February 2004.
- Traffic (2001b). CITES Appendix III Implementation for Big-leafed Mahogany *Swietenia macrophylla*. October 3-5, 2001, Santa Cruz de la Sierra (Bolivia), Mahogany Working Group.
- Treminio Urbina, W. (14 de septiembre de 2002). Miskitos se organizan para enfrentar despojo. Managua, La Prensa: 7B.
- Tropical Science Center (2000). Evaluation of Mahogany (*Swietenia macrophylla* King) in Mesoamerica. Costa Rica, Proarca/Capas.
- Urbina, M. (1994). El Centro de Mejoramiento Genético y Banco de Semillas Forestales. Pinos de Nicaragua. MARENA-DANIDA. Managua: 42-44.
- Uvin, P., P. S. Jain and L.D. Brown (2000). "Think Large and Act Small: Toward a New Paradigm for NGO Scaling Up." World Development 28(8): 1409-1419.
- Van Cott, D. L. (2000). The Friendly Liquidation of the Past: The Politics of Diversity in Latin America. Pittsburgh, University of Pittsburgh Press.
- van de Sandt, J. (2003). "Communal Resource Tenure and the Quest for Indigenous Autonomy: On state law and ethnic reorganization in two Colombian resguardos." Journal of Legal Pluralism and Unofficial Law 48: 125-162.
- Vandermeer, J., I. G. de la Cerda, D. Boucher, I. Perfecto and J. Ruiz (2000). "Hurricane disturbance and tropical tree species diversity." Science 290(5492): 788-791.

- Vandermeer, J. and I. Perfecto (2002). El bosque del tropico humedo no es fragil ni es estable. Ecología y Medio Ambiente en la Costa Caribe de Nicaragua: Descripción y Manejo de Ecosistemas Tropicales. D. Bradford. Managua, Multigrafic: 21-58.
- Vayda, A. P. (1983). "Progressive Contextualization: Methods for Research in Human Ecology." Human Ecology 11(3): 265-279.
- Veríssimo, A., P. Barreto, R. Tarifa and C. Uhl (1995). "Extraction of a high-value natural resource in Amazonia: The case of mahogany." Forest Ecology and Management 72: 39-60.
- Vernooy, R., S. Gómez, V. Rivera, N. Long and D. Tijerino (2001). Cómo vamos a sobrevivir nosotros? aspectos de las pequeñas economías y autonomía de la Costa Caribe de Nicaragua. Managua, Centro de Investigaciones y Documentación de la Costa Atlántica.
- Vidaurre, J. C. (2000). Plan General de Manejo "Comunidad de Kukalaya," 2000-2003. Bilwi, Nicaragua.
- Vilas, C. M. (1990). Del Colonialismo a la Autonomía: Modernización Capitalista y Revolución Social en la Costa Atlántica. Managua, Nueva Nicaragua.
- von Oertzen, E., L. Rossbach and V. Wunderlich (1990). The Nicaraguan Mosquitia in Historical Documents, 1844-1927. Berlin, Dietrich Reimer Verlag.
- Wade, R. (1997). Greening the Bank: The Struggle over the Environment, 1970-1995. The World Bank: Its First Half-Century. D. Kapur, J. P. Lewis and R. Webb. Washington, D. C., Brookings Institution: 611-734.
- Walker, R. (1987). "Land Use Transition and Deforestation in Developing Countries." Geographical Analysis 19(1): 18-30.
- Walker, T. W. (2003). Nicaragua: Living the shadow of the eagle. Boulder, Westview Press.
- Wallerstein, I. (1979). The Capitalist World-Economy. Cambridge, Cambridge University Press.
- Wapner, P. (1996). Environmental Activism and World Civic Politics. Albany, State University of New York Press.
- Warren, K. J. (1990). "The Power and Promise of Ecological Feminism." Environmental Ethics 12: 125-146.

- Watts, M. (1994). "Development II: the privatization of everything?" Progress in Human Geography 18(3): 371-384.
- Watts, M. J. and J. McCarthy (1997). Nature as Artifice, Nature as Artifact: Development, Environment and Modernity in the Late Twentieth Century. Geographies of Economies. R. Lee and J. Wills. New York, Arnold: 71-86.
- Weaver, P. L. and G. P. Bauer (2000). Major Meliaceae in Nicaragua. Río Piedras, Puerto Rico, United States Department of Agriculture, Forest Service.
- Whitley, R. (1996). "Business systems and global commodity chains: competing or complementary forms of economic organization." Competition and Change 1: 411-425.
- Wiggins, A. (2002). El Alcance de la Sentencia de la Corte Interamericana de Derechos Humanos en el Caso Awas Tingni y sus Implicaciones para los Pueblos Indígenas de Nicaragua. Forum Awas Tingni, URACCAN, Bilwi, Nicaragua.
- Williams, R. W. (1999). "Environmental injustice in America and its politics of scale." Political Geography 18: 49-73.
- Wilshusen, P. R., S. R. Brechin, et al. (2002). "Reinventing a Square Wheel: Critique of a Resurgent "Protection Paradigm" in International Biodiversity Conservation." Society and Natural Resources 15: 17-40.
- World Bank (1978). Forestry Sector Policy Paper. Washington, D. C.
- World Bank (1994). Review of the Implementation of the Forest Sector Policy. Washington, D. C.
- World Bank (1998). Assessing Aid: What Works, What Doesn't, and Why. Oxford, Oxford University Press.
- World Bank (2000). Entering the 21st Century: World Development Report 1999/2000. New York, Oxford University Press.
- World Bank (2002). Project Appraisal Document, Land Regularization Project, Nicaragua, Report No: 22399-NI. Washington, D. C.
- WWF (2002). WWF Position Statement: Bigleaf Mahogany. 12th Meeting of the Conference of the Parties to CITES, Santiago, Chile.
- WWF (2003). Alianza Entre el Banco Mundial y WWF: Conservación y Uso Sostenible de los Bosques, Iniciativa en Nicaragua. Unpublished manuscript, WWF-Centro América.

- WWF (2004a). About WWF: How we work: 14 Ecoregion principles, World Wildlife Fund.
http://www.panda.org/about_wwf/how_we_work/ecoregions_14_principles.cfm.
 Accessed 9 December 2004.
- WWF (2004b). About WWF: How we work: Ecoregions, World Wildlife Fund.
http://www.panda.org/about_wwf/how_we_work/ecoregion_units.cfm. Accessed
 9 December 2004.
- WWF (2004c). Guía para la compra de productos maderables certificados. San José,
 Costa Rica, WWF Centroamérica.
- Yeung, H. W.-C. (1994). "Critical reviews of geographical perspectives on business organizations and the organization of production: towards a network approach." Progress in Human Geography 18: 460-490.
- Yeung, H. W.-C. (2000). "Organizing 'the firm' in industrial geography I: Networks, institutions and regional development." Progress in Human Geography 24: 301-315.
- Young, O. R. (2002a). The Institutional Dimensions of Environmental Change: Fit, Interplay, and Scale. Cambridge, MIT.
- Young, O. R. (2002b). Institutional Interplay: The Environmental Consequences of Cross-Scale Interactions. The Drama of the Commons. National Research Council. Washington, D.C., National Academy Press: 263-291.
- Zamora, D. (1999). Plan General de Manejo "El Limón," 1999-2000. Prinzapolka, Nicaragua, Comunidad Alamikamba.
- Zamora, D. (2001). Plan General de Manejo "Layasiksa," 2002-2010. Prinzapolka, Nicaragua, PRADA, S.A.
- Zerner, C. (2000). Toward a Broader Vision of Justice and Nature Conservation. People, Plants and Justice: The Politics of Nature Conservation. C. Zerner. New York, Columbia University Press: 3-20.
- Zimmerer, K. S. (1996). Discourse on Soil Loss in Bolivia: Sustainability and the search for socioenvironmental "middle ground". Liberation Ecologies: Environment, Development, Social Movements. R. Peet and M. Watts. New York, Routledge: 110-124.
- Zimmerer, K. S. (2000). "Re-scaling Irrigation in Latin America: The Cultural Images and Political Ecology of Water Resources." Ecumene 7(2): 150-175.

- Zimmerer, K. S. (2000). "The Reworking of Conservation Geographies: Nonequilibrium Landscapes and Nature-Society Hybrids." Annals of the Association of American Geographers 90(2): 356-369.
- Zimmerer, K. S. and T. J. Bassett, Eds. (2003). Political Ecology: An Integrative Approach to Geography and Environment-Development Studies. New York, Guilford.
- Zimmerer, K. S. and K. R. Young, Eds. (1998). Nature's Geography: New Lessons for Conservation in Developing Countries. Madison, University of Wisconsin Press.
- Zimmerman, L. (1998). "'None of the Above' Wins Coastal Election." Nicaragua Monitor 76: 5.

Vita

Mary Munro Brook was born in Lancaster, New Hampshire on December 22, 1971 to Munro Spaulding and Roberta Elisabeth Brook. She was raised in Waltham, Vermont and graduated from Vergennes Union High School. Mary began classes at the University of Vermont in 1989. She completed a B.A. in Environmental Studies in 1995 with program and school honors. Her thesis focused on the organizational strategies of widows from Guatemala's civil war. After graduation, Mary coordinated the Burlington-Puerto Cabezas (Bilwi) Sister City Program, which focused on sustainable forestry and agriculture programs in eastern Nicaragua as well as cultural exchange between Vermont and Central America. In 1997, Mary married Elvis Teodoro Finley. They moved to New Orleans where Mary initiated graduate school at Tulane University in Latin American Studies. Her thesis examined transnational logging companies working in indigenous villages in northeastern Nicaragua and the multi-scale political process surrounding their approval. Upon completing her M.A., Mary began the doctoral program at the Department of Geography and the Environment at the University of Texas at Austin in 1999. Mary was accepted as a doctoral candidate in 2001 and initiated twenty months of fieldwork in Nicaragua in January of 2002. In 2004, Mary and Elvis celebrated the birth of their daughter, Estebana Elisabeth.

Permanent address: 545 South Prospect Street #38, Burlington, Vermont 05401

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